

Research Article

Leucocyte count in breastfeeding mothers in Owerri Metropolis

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Abstract: The Leucocytes counts of breastfeeding mothers were determined in Owerri Metropolis. The aim was to ascertain, if breastfeeding could affect the Leucocytes count negatively either increasing or decreasing the count. The test was done using confirmed apparently healthy breastfeeding mothers who visited the hospital to immunize their young ones (babies) and non breastfeeding adult females randomly selected who were not nursing any baby or breastfeeding and were selected from the students of Imo State University. A total of 100 subjects were used for the study, 50 breastfeeding mothers and 50 non-breastfeeding mothers who served as control. The test was run using standard hematological techniques. The result when analyzed with student T-test give range of $1.43 \times 10^9/l$ - $3.42 \times 10^9/l$ as against $1.4 \times 10^9/l$ - $3.70 \times 10^9/l$ from control subjects given no significance difference. The study revealed that under normal health condition breastfeeding mother enjoy the same value of total white cell count with the non-breastfeeding counterpart.

Keywords: Leucocyte count, Breastfeeding mothers, Non-breastfeeding mothers

INTRODUCTION

Human blood is the fluid circulated by the heart through the human vascular system [1]. Blood is a mixture of cells and watery liquid called plasma in which the cells are suspended. There are three cellular components of human blood [2].

- The red cells
- The white cells
- The platelets

Red blood cells transfer oxygen to the cells of the body packed with haemoglobin (a non -breaking protein) and shaped like plump disks with indented centers. The platelet defend the body against excessive blood loss, while the white blood cells protects the body from infection attacking and destroying foreign particles like dust, pollen and viruses [3].

White blood cells are also called leucocytes, which are nucleated cells with a reference range of 3.5 - $10.5 \times 10^9/l$. They are of three types which are the granulocytes lymphocytes, and monocytes.

The granulocytes are in turn of three kinds which are the neutrophils, eosinophils, basophils

(because they contain granules that hold digestive enzymes) [3]. Neutrophils: kill invading bacteria ingesting and then digesting them. Eosinophils: kill parasites and are involved in allergic reactions.

Basophils functions are not well understood but are implicated in some myeloproliferative diseases [2]. Lymphocytes are key part of the body's immune system; they are of two kinds of leucocytes.

- T-cells (lymphocytes)
- B-lymphocytes.

The T-cells direct the activity of the immune system/ B-lymphocytes produces antibodies, which destroy foreign bodies. Monocytes, the largest kind of the white blood cells, enter the tissues of the body and turn into even larger cells called macrophages [1]. Macrophages eat foreign bacteria and destroy damaged old and dead cells of the body itself.

BREASTFEEDING

Breast feeding is the feeding of an infant or young adult child with breast milk directly from female human breast (via lactation) rather than from a-baby

bottle or other container. Babies have suckling reflex that enables them to suck and swallow milk. Human breast milk is the healthiest form of milk for babies [4]. There are few exceptions such as when the mother is taking certain drugs or is infected with T-lymphotrophic virus or as active untreated tuberculosis [5].

Regardless of this breastfeeding promotes health and helps to prevent diseases [6]. The world health organization (WHO) and the American Academy of Pediatrics (AAP). Emphasize the value of breastfeeding for mothers as well as children, both recommended exclusive breastfeeding for the first six months of life [7].

Not all the properties of breast milk are understood but its nutrient content is relatively stable. Breast milk is made from nutrients in the mother's blood stream and bodily stores. Breast milk has just the right amount of fat, sugar, water and protein that is needed for a baby's growth and development [8]. The quality of a mother's breast milk may be compromised by smoking, alcoholic beverages, caffeinated drinks, marijuana, methadone [9].

Babies do not have fully functioning immune system until they are one year old. For the first year of life a breast feeding mother actually provides the immune response for a baby [3] who is exposed to cold and flu. If a baby were to suffer a cold, his mother would immediately start to increase her white blood cell production to counteract the bacteria or virus whether or not she experience the baby symptoms, thus the baby get the doses of immunity through breast milk [10]. Breast milk contains many white cells (The blood cells that fight bacteria, viruses and parasites) and these have been indicated to confer immunological protection against many infections [11]. Increase or decrease in the number of white blood cells in the maternal blood results from different diseases and disorders of white blood cells [12].

Justification

The study was to ascertain the total white cell count of apparently healthy breastfeeding mother to determine if the count would deviate from the value from non-breastfeeding apparently health subjects. This is necessary because mothers lose a lot of blood during child birth and thereafter share their nutritional intake with their young ones (babies) through breastfeeding. This days women are advised to breastfeed exclusively and most of them comply with that, one would want to know if this procedure of exclusive breastfeeding affect the white cell count which is one of the protective cells in the body.

Objectives

- To determine the white blood cell concentration of breastfeeding mothers.

- To compare the result obtained with the white cell concentration in non breastfeeding mothers.

MATERIAL AND METHOD

This study was carried out at the federal medical centre in Imo State. The study subjects were breastfeeding and non-breastfeeding mothers.

Study subjects

This study was carried out on one hundred subjects of which fifty (50) were breastfeeding mothers (test subjects) and fifty (50) were non-breastfeeding mother (control subjects)

Informed content

The consent of the Chief medical director and the head of medical laboratory department of the hospital were sought for and gotten. The consent of the subjects were also sought for and gotten before sample were collected from them.

Sample Collection

2ml syringes of needle size 23Gx1 were used to collect 1ml venous blood from the patient and dispensed into an ethylene diamine tetra acetic acid (EDTA) anticoagulant bottle and mixed properly.

Total White Blood Cell Count

Principle

Whole blood is diluted appropriately using a diluents which heamolysis red blood cells, leaving all the nucleated (white blood cell) to be counted. The white blood cells are counted microscopically using an improved Neubauer counting chamber and the number of white blood cells per liter of blood is calculated.

Method

Prepare 1:20 dilution of the blood in the diluting fluid 0.02ml of well mixed ethylene diamine tetra acetic acid anticoagulated blood was added to 0.35ml of diluting fluid in a rest tube using the hemoglobin pipette and mixed well and the tube was placed on the rack.

The counting areas of the haemocytometer cover glass were completely cleaned and dried with cotton wool, the counting chamber was then changed by moistening the raised shoulders of the chamber and counting the areas, sliding the cover slip onto the shoulder with both thumbs until rainbow colors (Newton's ring) appears. The diluted blood sample that was mixed and Pasteur pipette held at an angle of about 45°C was used to fill the chamber with the blood samples. The chamber was placed in a moist chamber (cleaned with cotton wool and covered with a lid). It was then left for 2-3 minutes in order for the white blood cells to settle. The underside of the chamber was dried and placed on the microscope stage, viewed using

x10 objectives, locating the four large corners squared; the area of these squares is 4mm² and counting done using x40 objectives [13] and [3].

References Ranges

Children 1yr = 6.0 -18.0x10⁹/L
 4-7yrs =5.0 - 15.0 x10⁹/L
 Adult =2.6 -8.3 x 10⁹/L

Statistical Analysis

All values were expressed as mean ± SD, The statistical analysis done using the (student t-test), were carried out to detect the significant differences in breastfeeding mothers and their total white blood cell count. Therefore the t-test was p>0.05 were considered non-significant.

RESULT ANALYSIS

A total of hundreds (100) mothers were examined, out of this number 50(50%) were breastfeeding and 50(50%) were non-breastfeeding mothers (test and control respectively).

The result of the, mean ±SD of white blood cell concentration were presented in table 1, 2 and 3 below. The level of significance was determined using the student's t-test. When the mean ±SD of the white blood cells counts in breastfeeding mothers was compared to the non-breastfeeding mothers, it showed non-significant and the P value is (P>0.05).

Table-1: Shows the mean and standard deviation of white blood cell count from breastfeeding mothers.

Subject	Parameter	Mean	Standard deviation
Test(50)	WBCX10 ⁹ /L	3.42x10 ⁹ /L	1.43X10 ⁹ /L

Table-2: Shows the mean and standard deviation of white blood cell count from non-breastfeeding mothers.

Subject	Parameter	Mean	Standard deviation
Control(50)	WBCX10 ⁹ /L	3.7x10 ⁹ /L	1.4X10 ⁹ /L

Table-3: Shows the mean, standard deviation, p-value of white blood cell count from test subjects when compared with the control subjects, shows non-significant.

Parameter	Test subject n=25	Control n=15	p-value	Remark
WBCX10 ⁹ /L	3.42±1.43x10 ⁹ /L	3.7±1.04X10 ⁹ /L	0.4	Non- significant

DISCUSSION

This study was conducted to evaluate the level of white blood cells on breastfeeding mothers in Owerri metropolis. A total of forty subjects comprising (50) breastfeeding mother and (50) non-breastfeeding mothers who serve as control. The test was done using standard* hematological procedure and method. The result (3.42±1.43x10⁹/L) obtained showed no significant difference when compared with the result of the control as indicated in table 4.3 with (p>0.05). This result is in agreement with a similar work conducted by Park et al.[14] which reported that under non-pathological condition, the total white blood cell count of the lactating mothers when compared with non-lactating mothers does not decrease or show any significant different. This means that breastfeeding does not decrease or increase the level of white blood cells in the maternal blood circulation. This result indicated that subject used for the study were not exposed to infection that could lead to increase in total and differential white blood cell counts.

It equally revealed that breastfeeding may not expose some women to some viral, parasitic or bacterial infection which may increase or decreases white blood cell count.

CONCLUSION

This study has shown that there was no decrease in the leukocyte concentration of lactating mothers. It has also been inferred that a marked of increase or decrease in the leukocyte concentration in breastfeeding mothers is really associated with pathology.

REFERENCES

- Lewis SM, Brain BJ, Bates 1; collection and handling of blood. In practical hematology (10th edition). Pg 1-8 Churchill living store, Edinburgh.Leuko- American family physician (2000), 2006; 62(9): 2053-2060.
- Hoffbrand, AV, Moss PAH; The non-leukemic myeloproliferative neoplasms. IN Essential hematology (6th edition).Wiley-Black well production, 2011; 201-2015.
- Ochie J, Kolhaltor A; Leucopoiesis. In medical

- laboratory science, theory and practice; 6th edition. Tata Me Graw-Hill Publishers, 2008; 279-281.
4. Picciano M; Nutrient composition of human milk: *pediatric Clin North Am*, 2001; 48(1): 53-67.
 5. Falco M; Study lack of breastfeeding costs lives, billions of dollars, 2000.
 6. Bartick M, Reinhold A; The burden of sub optimal breastfeeding in the United State: *Pediatric*; 2010; 125(s): 1048-1056.
 7. World Health organization; Global strategy for Infant and gonad child feeding. Geneva. Switzerland, 2003.
 8. Steven KG; Mothers and children Benefit from Breastfeeding. *Woman health* (ed) ppi6, 2009.
 9. Fisher D; Social drugs and breastfeeding. Queensland, Australia, Health, 2006.
 10. Baker, FJ, Silvertone RE, Pallister C; Human Milk Substitutes: An American prospective *Minerva Pediatric*, 2003; 55(3): 195-207.
 11. Goldman AS; the Immune system of human milk: *pediatrics infant Dis. J*, 1993; 12:664-672.
 12. Makoha EP, Songok PM, Orago AA, Koechi DK; Material Immune responses and risk of infant infection with Hiv-1 *Afr. Med. J*, 2002; 79(11): 567-573
 13. Cheesbrough M; Counting of white cells, *District laboratory practices in Tropicql countries vol. 2* Cambridge U niversity Press. Publishers London, 2000; 314-317.
 14. Park YH, Fox LK, Hamilton, David WC; Bovine Mononuclear Leucocyte subpopulation in peripheral blood and mammary gland secret/on during lactation, *A journal of vertinary microbiology and pathology*, 2008; 45:20-23.