Leucocyte count in breastfeeding mothers in Owerri Metropolis
Obeagu Emmanuel Ifeanyi*, 1, OkoroIU IL2, Obeagu Getrude Uzoma3, Adaka Doris4, Elemchukwu Queen5

1Diagnostic Laboratory Unit, Department of University Health Services, Michael Okpara University of Agriculture, Umudike, Abia State, Nigeria.
2Department of Medical Laboratory Science, Imo State University, Owerri, Nigeria.
3Department of Nursing Science, Ebonyi State University, Abakaliki, Nigeria.
4Department of Medical Laboratory Science, Federal Medical Centre, Owerri, Nigeria.
5School of Health Technology, PortHarcourt, Rivers State, Nigeria.

*Corresponding author
Obeagu Emmanuel Ifeanyi
Email: emmanuelobeagu@yahoo.com

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 1.43x10⁹/L - 3.42x10⁹/L as against 1.4x10⁹/L - 3.70x10⁹/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 3.5-10.5x10⁹/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. Basophil 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 sucking 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
gets 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 healthy 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
count 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 haemolysis 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 lyr = 6.0 -18.0x10⁹/L,
4-7yrs =5.0 - 15.0 x 10⁹/L
Adult =2.6 - 8.3 x 10⁹/L

Statistical Analysis
All value 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.

<table>
<thead>
<tr>
<th>Subject</th>
<th>Parameter</th>
<th>Mean</th>
<th>Standard deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test(50)</td>
<td>WBCX10⁹/L</td>
<td>3.42x10⁹/L</td>
<td>1.43X10⁹/L</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Subject</th>
<th>Parameter</th>
<th>Mean</th>
<th>Standard deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control(50)</td>
<td>WBCX10⁹/L</td>
<td>3.7x10⁹/L</td>
<td>1.4X10⁹/L</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Test subject n=25</th>
<th>Control n=15</th>
<th>p-value</th>
<th>Remark</th>
</tr>
</thead>
<tbody>
<tr>
<td>WBCX10⁹/L</td>
<td>3.42±1.43x10⁹/L</td>
<td>3.7±1.04X10⁹/L</td>
<td>0.4</td>
<td>Non-significant</td>
</tr>
</tbody>
</table>

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.

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).

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
3. Ochie J, Kolhaltor A; Leucopoiesis. In medical
5. Falco M; Study lack of breastfeeding costs lives, billions of dollars, 2000.