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# International Journal of Advanced Research in Biological Sciences

ISSN : 2348-8069

www.ijarbs.com

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## Research Article



### Reticulocyte count in healthy male and female students of imo state university,owerri.

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#### Abstract

The reticulocyte counts of students in Imo State University,Owerri,were evaluated.The aim was to determine the reticulocyte value among healthy male and femalle students of Imo State University,Owerri.A total of two hundred students comprising hundred males (100) and hundred females (100) with age range of 20-45 years engaged in the study and the analysis done using standard haematological method.There was no significant difference in the reticulocyte count of the students( $p>0.05$ ) compared to the normal range.The reticulocyte count of males were significantly lower ( $p<0.05$ ) to the female reticulocyte count.

**Keywords:** Reticulocyte,Reticulocyte Count,Reticulocyte Index, Healthy Male students, Healthy Female Students.

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#### Introduction

Reticulocyte is loosely defined as the penultimate stage in erythroid maturation,no single definition exists for reticulocyte since it represents a continuum between extrusion of the pyknotic erythroblast nucleus and the disappearance of mitochondria and ribosomes.The maturation stages of the reticulocyte were decribed by Heilmeyer et al.(2002) .

Reticulocytes are immature red blood cell typically composing about 1% of the red blood cell in the human body (Davis and Bigelow,2004).It is also a non-nucleated immature red cell in peripheral blood,containing residual RNA.Reticulocyte develops and matures in the red bone marrow and then circulate for about a day in the blood.Like mature red blood cell,reticulocyte do not have cell nucleus.They are also called reticulocyte because of a reticular network of ribosomal RNA that becomes visible under a

microscope with certain stain such as new methylene blue (Davis and Bigelow,2004).

Reticulocyte differ from other red cells in that they have a more convoluted shape,and are about 8% larger than the more mature cells (Gilmer and Koepke,2006).The reticulocyte percentage in the peripheral blood is an indication of the rapidity of red cell turnover if the patient is in a steady state.However,the number of reticulocyte released into the blood reflects the amount of erythropoiesis on a given day (Bessman,2007).

Reticulocyte count is the number of reticulocyte in a whole blood specimen,used in determinig bone marrow activity (Mosby's Medical Dictionary,2009).A reticulocyte count is a blood test performed to assess the body's production of

immature red blood cells. A reticulocyte count is usually performed when patients are evaluated for anaemia and response to its treatment. It is sometimes called a retics count (Rowen et al., 2006). It also provides information about the rate at which the bone marrow is producing red cell. A normal count means that the production is adequate, a decreased count means it is not. 7 hours information helps determine whether a lack of red cell in an anaemic person is caused by a bone marrow problem, by excessive bleeding, or by the red cell destruction (Rowen et al., 2006).

### Aim and Objectives

- i. To determine the reticulocyte value among healthy male and female of Imo State University, Owerri.
- ii. To compare the values with documented values reference range so as to determine the normal values obtainable in this part of world.
- iii. To compare reticulocyte value between male and female students.

### Materials and Methods

**Study Area:** The study was done in Imo State University, Owerri.

### Study population and enrolment

A total of two hundred (200) subjects were used in the study. This comprised of one hundred (100) apparently healthy male and one hundred (100) apparently healthy female of Imo State University, Owerri, all between the ages of 20–45 years. Subjects above or below the age bracket were excluded, also those with ill health and those that fail to give their consent were excluded from the study.

**Ethics:** Informed consent was obtained from all the subjects for the study.

**Sample:** 4ml of blood were collected from each of the subjects into EDTA anticoagulated containers.

### Laboratory methods and procedures

#### Reticulocyte count (Cheesbrough, 2000)

#### Principle

An isotonic solution of a supravital stain such as new methylene blue or brilliant cresyl blue is incubated

with a few drops of blood. To detect ribosomal RNA in reticulocytes, the red cells must be stained while they are still living. A thin preparation is made and the reticulocyte counted microscopically. Reticulocytes are recognised by the violet blue stained granules of ribosomal RNA (reticulin) they contain. The reticulocyte count is expressed as a percentage, as an index (RI) (Cheesbrough, 2000).

### Procedures

1. 3 drops of new methylene blue was pipetted into a small tube.
2. 4 drops of EDTA anticoagulated blood was added and mixed well.
3. It was incubated at 37 °C for 15 minutes.
4. It was gently mixed to re-suspend the red cells.
5. With the help of plastic blue pipette, a drop of the stained blood was transferred to a clean grease free slide and a thin film was made.
6. The slide was waved back and forth to air-dry the film.
7. The reticulocyte was counted microscopically using the x10 objective to check the distribution of the red cells.
8. An area where the red cells can be seen individually was selected and a drop of immersion oil was added and examined.
9. The red cells were systematically counted, noting the number that are reticulocytes.

### Statistical analysis

Values obtained were expressed as mean ± S.D. The results were analysed using t-test and statistical significance set at P < 0.05

### Results

**Table 1: mean reticulocyte count of the students**

Parameter	Students	Control (Normal Range)	Significance level
Reticulocyte(%)	1.67 ± 0.86	0.5-2.5	p > 0.05

**Table 2: mean reticulocyte count based on gender**

Parameter	Female(100)	Male(100)	Level of significance
Reticulocyte(%)	1.67 ± 1.02	1.65 ± 0.76	p > 0.05

## Discussion

Reticulocyte count is a blood test that measures how fast red blood cells called reticulocyte are made by the bone marrow and released into the blood (Chemcky and Berger, 2008). Indirectly, it is used as a marker to measure the activity of the bone marrow and directly in the evaluation of anaemia and it is mostly called the retics count. However, from the result obtained, the reticulocyte count ( $1.67 \pm 0.86$ ) of the students showed no significant difference ( $p > 0.05$ ) when compared to normal range (0.05-2.5).

The reticulocyte value showed no significant difference ( $p > 0.05$ ) when compared based on gender even though that of females were slightly higher than that of males. This may be due to the lower value of haemoglobin concentration in female subjects.

## Conclusion

Reticulocyte count is very important haematological parameters that reflect by way of its value in activity of the bone marrow and entire erythropoietic system. Although with a population size of thirty (30) students obtained has invariably shown that academic activity has no significant effect on the reticulocyte count of those under study. The test should be done together with other parameters in any disease conditions most especially on those that have a direct effect on the blood and the marrow.

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