EUROPEAN JOURNAL OF BIOMEDICAL AND PHARMACEUTICAL SCIENCES
http://www.ejbps.com

ISSN 2349-8870
Volume: 5
Issue: 1
90-92
Year: 2018

RETICULOCYTE COUNT AND INDICES AMONG AL NEELAIN UNIVERSITY STUDENTS

Tagwa Makwai Sati and Ibrahim Khider Ibrahim*

Department of Hematology, Faculty of Medical Laboratory Sciences, Al-Neelain University, Khartoum, Sudan.

***Corresponding Author: Ibrahim Khider Ibrahim**
Department of Hematology, Faculty of Medical Laboratory Sciences, Al-Neelain University, Khartoum, Sudan.

Article Received on 06/11/2017 **Article Revised on 27/11/2017** **Article Accepted on 18/12/2017**

ABSTRACT
The reticulocyte count is one of the most common hematological tests to classify and monitor the treatment of different types of anemia, as well as to determine if the bone marrow is functional[8] Indirectly, it is used as a marker to measure the activivty of the bone marrow and directly in the evaluation of anaemia and it is mostly called the retics count. An increase of immature reticulocytes in the blood of individuals with iron deficiency anemia represents a response to anemia, as long as the medullary tissue and the indispensable factors for erythropoiesis are preserved. The reticulocyte counts and absolute reticulocyte count and CRC of students in ALNeelain university, were evaluated. The aim was to determine the reticulocyte and absolute reticulocyte count and CRC value among healthy female students of ALNeelain university A total of 50 healthy female students with age range of 18-23 years engaged in the study, reticulocyte count performed by using supervital stain (new methyeneblue) and the analysis done using statistical package for social sciences (SPSS). The result of the healthy female students was within normal range and significantly lower when compared to the mean value of normal range.

KEYWORDS: Reticulocyte, Reticulocyte Count, Absolute Reticulocyte count, CRC, Healthy Female Students.

INTRODUCTION
Young females are at risk of nutrient deficiencies due to poor diets and higher requirements for micronutrients, such as iron and folate especially in the periconceptional period.[1] Female adolescents and adults are among the population groups who are most affected by iron deficiency. High demand for iron during rapid growth, accompanied by dietary deficiencies and menstrual blood loss, are the most common causes of iron deficiency in young women.

The World Health Organization (WHO) estimates that 1.62 billion people (95% confidence interval [CI]: 1.50, 1.74 billion), corresponding to 24.8% (95% CI: 22.9, 26.7) of the global population, are affected by anemia. However, although anemia affects all population groups in all countries of the world, certain groups are more vulnerable than others. The highest prevalence tends to be in preschool-age children (ie, those aged 6–59 months), women of reproductive age (i.e., those aged 15–49 years).[2]

Reticulocytes are non-nucleated immature red blood cells in peripheral blood, containing residual RNA.[3] The manual method for reticulocyte counts is the most commonly used in clinical laboratories, and is based on microscopic observation of residual ribosomal RNA, easily recognized by supravital staining.[4] On exposure of unfixed cells to certain dyes, such as brilliant cresyl blue or 'new methylene blue', the ribosomes are precipitated and stained by the dye, to appear as a reticular network; as the cells are still living when exposed to the dye, this is referred to as supravital staining. With new methylene blue, red cells stain a pale greenish-blue while the reticulum stains bluish-purple. The amount of reticulum in a reticulocyte varies from a large clump in the most immature cells (group I reticulocytes) to a few granules in the most mature forms (group IV reticulocytes).[5] The RNA, which is responsible for forming the reticulum following supravital staining, gives rise, on Romanowsky-stained films, to diffuse cytoplasmic basophilia. The combination of cytoplasmic basophilia with the acidophilia of haemoglobin produces staining characteristics known as polychromasia. Not all reticulocytes contain enough RNA to cause polychromasia on a Romanowsky-stained film, but whether polychromatic cells correspondonly to the least mature reticulocytes (equivalent to the group I reticulocytes),[6] or to all but the most mature reticulocytes (group I, II and III reticulocytes)[7] is not certain. Reticulocyte counts have traditionally been

expressed as a percentage. If an RBC is available an absolute reticulocyte count, which gives a more accurate impression of bone marrow output, can be calculated. As an alternative, a result that is more meaningful than a percentage can be produced by correcting for the degree of anaemia as follows:
Reticulocyte index =
Reticulocyte percentage * Observed PCV/normal PCV.

Insufficient intake, imbalanced and nutritionally poor food in the university housing may result in various types of metabolic disorders.

The lack or insufficiency of vital food elements expose the students to many diseases such as:

- IDA resulting from iron deficiency, bone formation disorders result from lack of Ca. in addition.
- To this lack of minerals and vitamins may induce various neurological disorders.
- Inadequate food intake which might be due to economical, physiological or psychological cause may lead to in sufficient supply of body with vital food elements that may lead to several disease or disorders unless the situation is corrected.
- Even with the presences of food in ssuficent quantitis food hygiene and proper handling remains an irritating issue.

MATERIALS AND METHODS

The design of study was a cross-sectional study. The study was conducted AL Neelain University, in the period from April to July 2017. A total of (50) subject of healthy female students was used in the study. Approximately (2.5 ml) EDTA anti-coagulated venous blood samples obtained from each of the subjects Blood Samples were collected from individuals upon their agreement and the ethical approval obtained from the ethical committee of faculty of medical laboratory sciences, Al Neelain University. Reticulocyte count It was done using newmethylene blue super vital stain by used method found in(Dacie and Lewis)[8] and calculated absolute reticulocyte In order to get a more accurate assessment of bone marrow function, the calculated reticulocyte percentage (%) was corrected with a calculation called a corrected reticulocyte count or a reticulocyte index (RI). This calculation compares the patient's hematocrit with a normal hematocrit value. The statistical analysis was performed using statistical package for social sciences (SPSS).and used one sample test.

RESULTS

A total of 50 individuals participated in the study, their ages ranged from 18 to 23 years,

Table-1.

Retics Parameters	Mean	STD	P.value
Retics%	0.81	0.22	0.000
Absolute Retics count	37.5	11.3	0.000
CRC	0.62	0.17	0.000

Table-2.

Retics Parameters	Mean	Mean of normal range	P.value
Retics%	0.81	1	0.000
Absolute Retics count	37.5	60	0.000

The mean Reticulocyte count among healthy female student was 0.81and STD 0.22statisticaly significant diffrence p.*value* 0.0001, the mean absolute reticulocyte count was 37.5; STD 11.3 statisticaly significant p.value 0.0001, the mean CRC was 0.62 STD 0.17statisticale significant p.*value* 0.0001.Table 1.

Mean value 0.81was lower to the mean value of normal range 1 and statistically significant diffrence p.*value* 0.0001.also mean absolute reticulocyte count was 37.5 lower to the mean value of normal range 60 and statistically significant difference p.value 0.0001. Table 2.

DISCUSSION

The reticulocyte count is one of the most common hematological tests to classify and monitor the treatment of different types of anemia, as well as to determine if the bone marrow is functional[9] Indirectly, it is used as a marker to measure the activivty of the bone marrow and directly in the evaluation of anaemia and it is mostly called the retics count. An increase of immature reticulocytes in the blood of individuals with iron deficiency anemia represents a response to anemia, as long as the medullary tissue and the indispensable factors for erythropoiesis are preserved However, from the result obtained, the reticulocyte count. In this study within normal range but lower to the mean value of normal range. The mean reticulocyte count among healthy female student was 0.81and STD 0.22statisticaly significant diffrence p.value 0.0001, the mean absolute reticulocyte count was 37.5,STD 11.3 statisticaly significant p.value 0.0001,the mean CRC was 0.62 STD 0.17statisticale significant p.value 0.0001.table 1.

Mean value 0.81was lower to the mean value of normal range 1 and statistically significant diffrence p.value 0.0001.also mean absolute reticulocyte count was 37.5 lower to the mean value of normal range 60 and statistically significant difference p.value 0.0001.

The result in another study was done by Okoroiwu, I.L.1, Obeagu, Emmanuel Ifeanyi2*, Elemchukwu,Queen3 and Daniel-Igwe,Gloria4 in healthy male and female students of imo state university,owerri However,from the result obtained,the reticulocyte count(1.67 ±0.86) of the students showed no significant differnece (p>0.05) when compared to normal range(0.05-2.5).

CONCLUSION

In summary the results suggest that the reticulocyte count and absolute reticulocyte and corrected reticulocyte count in female student's university are

within normal range put lower to the mean value of normal range.

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