THE IMPORTANCE OF THE HAEMATOCRIT IN THE FERRIPRIVE ANEMIA

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Abstract
The haematocrit depends of the erythrocytes weight, the average erythrocytes volume and the plasmatic volume.
Usually when the erythrocytes have a normal size, the modifications of the haematocrit follows those of the number of erythrocytes.

Key words: hematopoiesis, stem cells, blood cells, haematocrit

INTRODUCTION

The forming of the figurative elements of the blood begins in the bone marrow starting from a single type of cell, name pluripotent hematopoietic stem cell of which are derived all the circulator blood cells. While these cells are divided a small percentage of them keeps identical characteristics of the original pluripotent cells and remain in the bone marrow to assure a permanent reserve of these cells, with all these, their number decreases together with the age. Most of the divided cells are differentiated in order to form the other types of cells. The cells from the intermediary levels are very similar to the pluripotent stem cells, although they are already dedicated to a certain cellular line and are called specialized stem cells.

When are raised in cultures, the different specialized stem cells will produce colonies of blood cells.

A specialized stem cell that produces erythrocytes is named unit forming of erythrocytes colonies (CFU-E).

Similarly, the units forming colonies that produce granulocytes and monocytes are called CFU-GM.

The growth and the divisions of the different stem cells are controlled by more proteins, named inductors of growth. There were four important inductors of growth described, each having different characteristics. On of these is interleukina-3 (IL-3), that stimulates the growth and division of all types of stem cells.

The inductors of growth stimulate the growth but not the differentiation of the cells. This is the role of another set of proteins named inductors of the differentiation. The action of each of these inductors will

determine a type of specialized stem cell to differentiate and travel one or more stages to the final stage of adult blood cell.

The formation of the inductors of growth and of those of differentiation is in their turn controlled by factors from the bone marrow (for ex. in case of erythrocytes, the exposure of blood for a longer period of time to decreased concentrations of oxygen determines the stimulation of the growth and differentiation, and the final differentiation and formation of leucocytes, that are necessary for the fight against the infection).

MATERIAL AND METHOD

In order to accomplish the proposed objectives, was appealed to a prospective study.

In this regard was created a lot of 45 patients with the diagnosis of Ferriprive anemia. The patients come from the department of hematology from the Oradea County Hospital, being admitted during the year 2012.

Each of these patients had their blood analysis taken, by determining: the hematological and biochemical tests.
The determinations were made respecting the following conditions:
- *the preparing of the patient* - à jeun (before eating);
- *specimen harvested* - venous blood;
- *recipient of harvesting* – vacutainer with citrate of sodium 0.105 M (report citrate of sodium – blood=1/9);
- *harvested quantity* – as much as the vacuum allows; in order to prevent the partial coagulation of the sample was assured the right mixture of the blood with the anticoagulant, by movements of inversion of the tube (5-6 mild inversions);
- *causes of rejecting the sample* - vacutainer that is not full (at least 90%); the hemolysate or coagulated sample, the harvested sample in another tube than with citrate;
- *necessary processing after harvesting* – the sample was centrifuged 15 minutes at 2500g;
- *stability of the sample* – the sample is stable *8 hours* at the room temperature; the separate plasma is stable *3 weeks at* -20ºC; *>1 year* at -70ºC. Before the analysis, the refrigerated samples were defrosted fast in 3-5 min at 37ºC. The defrosting at smaller temperatures can produce cryoprecipitation.

RESULTS AND DISSCUSIONS

The bioclinical explorations were found at 90 patients with ferriprive anemia.
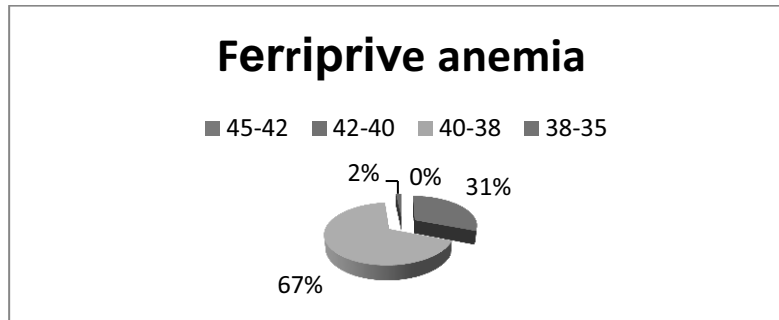

Figure 1. The distribution of the cases depending on the value of the haematocrit.

Even if the diagnosis of ferriprive anemia became easily by determining the blood test and of serum iron level, the early evaluation of the prognosis remains a clinical challenge in a beginning stage of the disease.

The decrease of the concentration of Hb,Htc, with simultaneous hypochromia (EM< 27pg, CHEM< 30%) and the influence on the number of blood cells is absent.

Other times, the blood cells can appear decreased, associated with the modification of the erythrocytes morphology, blood cells in "sign of bulls eye", respectively the reticulocytes can have a normal value or can present minor deviations more or less; small granulocytopenia and thrombocytosis in severe forms.

The color for Fe of the medullary smear is the most faithful diagnosis test.

Thus, the serum Fe is present in most of the cases with a value of < 50μg/100ml, this fact being according to the specialty literature.

CONCLUSIONS

The determination of the blood cell test indicates normal value of the erythrocytes series, to over 75% of the patients with ferriprive anemia; in regard to the haematocrit and hemoglobin, all the patients with ferriprive anemia had decreased value. The color for Fe of the medullary smear is a prognosis marker for the ferriprive anemia.

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