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COMPARATIVE EVALUATION OF THERAPEUTIC EFFECT OF FERROCERONE IN ROSE SYRUP

Barno Inakova*

PhD, Docent,
Head of Department of Facultative Pediatric and Neonatology,
Andijan State Medical Institute, Andijan,
UZBEKISTAN

ABSTRACT

A new composition of ferroceron with improved organoleptic properties has been scientifically substantiated and proposed, which makes it possible to expand the scope of application of ferroceron in children with iron deficiency anemia, regardless of age. For the first time in young children with iron deficiency anemia, a comparative study of the therapeutic efficacy of ferroceron in rosehip syrup was carried out. At the same time, not only immediate but also long-term results of treatment were analyzed. The newly created composition of ferroceron in rosehip syrup, used as an iron-containing drug in the treatment of iron deficiency anemia in young children, turned out to be a highly effective agent without side properties. A comparative assessment of the antianemic effect of a combination of ferroceron and other iron-containing drugs, often used in children's practice, is given, which gave reason to recommend ferroceron with rosehip syrup as an antianemic drug that has an effect on the processes of hemoglobin synthesis and an erythrostimulating effect. The predominant both direct and long-term effect of treatment of children with ferroceron in rosehip syrup was revealed, which determined the created composition to be considered the drug of choice in the treatment of young children with iron deficiency anemia, an etiopathogenetic agent.

KEYWORDS: *Predominant, Syrup, Iron-Containing*

INTRODUCTION

Treating iron deficiency anemia in children, especially young children, is difficult. Until now, all issues of ferrotherapy, which is the basis of pathogenetic therapy for IDA, have not been sufficiently resolved[3].

Currently, despite the availability of a number of effective parenteral iron preparations, iron deficiency anemia is treated with oral preparations. This method is simple, affordable, and never leads to serious consequences.

A number of iron preparations used in the treatment of patients with IDA are already known. However, the reception of some of them is accompanied by a number of undesirable signs. Symptoms of intolerance are quite common (loss of appetite, nausea, vomiting, stomach pain, diarrhea). Therefore, in assessing the antianemic efficacy of the drug, in addition to the speed of onset of hematological remission, the absence of complications will also matter [9].

Some questions of the choice of a preparation containing iron, its dose, and the duration of administration are still open. The use of preparations containing ferrous salts is generally accepted[4].

In order to avoid side reactions, better tolerance of the selected iron preparations, it is recommended to start IDA treatment with half or one-third of the optimal dose and gradually, within 5-7 days, reach the age-specific daily dose. For young children, iron preparations are prescribed in conventional doses (5-8 mg of elemental iron per kg of body weight) [1,2,8].

For better absorption, the time of administration of drugs is also important. It was found that taking iron supplements after meals leads to its dilution by food masses, as a result of which the percentage of absorption decreases. Therefore, it is now considered justified to introduce them in the intervals between meals. For young children who are breastfed, iron supplements are prescribed 1 hour before meals or between meals, since milk reduces iron absorption by 10: Parenteral administration is recommended for disorders of intestinal absorption, poor tolerance of the drug, and also for some severe forms of IDA [3,7].

Based on the foregoing, as well as the goals and objectives of the study, we conducted a clinical and hematological comparison of the antianemic efficacy of the new ferrocron composition with the iron preparations most often used in pediatric practice for the treatment of IDA: iron lactate, Ferrum-lek, aloe syrup with iron [10].

MATERIALS AND METHODS

To study the antianemic effect of the combination of ferrocron in rosehip syrup, we examined 195 children aged 3 months to 3 years with iron deficiency anemia, who were on outpatient treatment. The control group consisted of 224 children of the same age.

RESULTS AND DISCUSSIONS

The age composition of the observed children is presented in Table 1.

TABLE 1 AGE COMPOSITION OF THE OBSERVED CHILDREN WITH IRON DEFICIENCY ANEMIA

Age of patients	Number of patients	%
from 3 months to one year	111	56,9
from 1 to 2 years	59	30,3
from 2 to 3 years	25	12,8

As can be seen from Table 1, in 170 children, anemia was noted at the age of 3 months to 2 years, which was 87.2%.

The diagnosis of iron deficiency anemia was established on the basis of the following criteria: serum iron level, total serum iron-binding capacity (TIBC), transferrin saturation coefficient with iron, latent serum iron-binding capacity.

When distributing patients according to the severity of iron deficiency anemia, we used the WHO recommendations. According to these recommendations, among the patients we examined with mild anemia (hemoglobin level 110-90 g / l) there were 104 children, with moderate severity (hemoglobin level 90-70 g / l). 1) - 70 children, and severe anemia (hemoglobin level below 70 g / l) was diagnosed in 21 children.

Table 2 contains data on the distribution of sick children according to the severity of anemia.

TABLE 2 DISTRIBUTION OF PATIENTS ACCORDING TO THE SEVERITY OF THE DISEASE

Severity of IDA	Number of patients	%
Severe anemia	21	10,7
Moderate anemia тяжести	70	36,0
Mild anemia	104	53,3

As can be seen from the data presented in Table 2, 21 children had severe and moderate anemia (47.7%), and mild anemia was diagnosed in 104 children (53.3%). It should be noted that 91 children with severe and moderate anemia are children mainly under the age of 1 year - 79 children: 18 children with severe anemia and 61 children were diagnosed with a moderate form of the disease.

Patients under our supervision were periodically admitted to the department for examination and, if necessary, for repeated treatment. Such observation in dynamics made it possible to obtain information not only about the initial period of the disease, but also to trace the further course of the disease, to study the immediate and long-term results of treatment. Clinical signs were characterized by symptoms characteristic of iron deficiency anemia.

Upon admission to the clinic, it was revealed: lag or delay in physical development in 152 sick children (77.9%), lag in psychomotor development - in 111 (56.9), general lethargy, drowsiness - in 164 (84.1%), appetite - in 161 (82.5), vomiting, regurgitation - in 89 (45.6), pallor of the mucous membranes and skin - in 195 (100%), dry skin - in 102 (52.3%), taste perversion - in 102 sick children (52.3%).

As can be seen from the data presented, the most frequent complaints were: lagging in weight gain, lagging behind or decreased appetite, vomiting, regurgitation, taste perversion, lethargy.

From the anamnesis it was found that about 80% of the examined children suffered from acute respiratory viral infection 3-4 times, therefore, children with iron deficiency anemia can be considered as often bleating children.

In some patients, we detected hyperpigmentation of the skin, most often on the face, neck, and lateral surfaces of the chest (8.2%). Changes in the oral mucosa were characterized by the smoothness of the papillae of the tongue ("lacquer tongue"), cracks, "seizures" in the corners of the mouth were observed, the so-called angular stomatitis was observed in 84 patients (43.1%), in 96 children (49.2%) there were signs of dry hair, increased fragility, hair loss.

It is necessary to emphasize the presence of symptoms of damage to the central nervous system in the form of mood swings in 54 children (27.7%), inactivity in 57 (29.2%) children, tearfulness in 64 children (32.8%). From the side of internal organs, we observed systolic murmur (in 148 children - 75.9%); an increase in the size of the liver (in 52 patients - 26.6%); spleen (in 28 patients - 14.3%). In 18 children, unstable stools were noted, constipation - in 11 children (5.6%).

We observed 195 children with iron deficiency anemia at the age from 0 to 3 years. The age of the examined was: from 0 to 1 year - 111 children, from 1 to 2 years - 59 children, from 3 years - 25 children.

As can be seen from the data presented, children under the age of 1 year prevail among the patients. This result is confirmed by the data of most authors with the highest prevalence of IDA among children of the studied age group.

All patients were treated with iron preparations. Of the total number of patients, 42 children received iron lactate, 48 - aloe syrup with iron, 45 - ferrum-lek, 60 - ferrociron in rosehip syrup. The drugs used enterally were mixed and diluted in fruit juice, young children willingly drank the prepared cocktail, we did not observe any side effects or complications. Ferrum-lek was administered enterally as a syrup.

Among the examined patients, 21 children were diagnosed with a severe form of the disease (hemoglobin concentration below 70 g / l), 70 children - moderate anemia (hemoglobin level was in the range of 90-70 g / l), the rest of children (104) - mild anemia degree. The causes of iron deficiency were found out and the symptoms of the disease and the frequency of their manifestation were assessed, the possibility of the presence of a feature was studied, and specialists were consulted.

Considering the possible participation of endogenous factors in the pathogenesis of hypohidrosis, namely, insufficient intake of iron and its deposition in the fetus in the antenatal period, the anamnesis was carefully studied in 193 mothers, as a result, abundant and prolonged blood loss was revealed in 111 mothers as a result of menstrual irregularities. frequent pregnancies were also noted; in 87 women at 11 half of pregnancy was observed long-term toxicosis. According to the anamnesis, 152 women suffered from hypochromic anemia during pregnancy, and 98 had chronic infections. Among the concomitant diseases, rheumatism, adnexitis, gastritis, gastric ulcer, cholecystitis were also noted. In 87 women, pregnancy was complicated and was characterized by the threat of termination.

Thus, the above factors acting in the antenatal period were the main reasons for the insufficient supply of iron from the mother. This confirms the conclusions of a number of researchers on the effect of endogenous iron deficiency on the occurrence of anemia in young children.

We carried out a study of the postnatal history in all examined children. It was revealed that out of 111 infants, 67 were artificially fed (60.4%), 44 children were breastfed (30.6%), 10 children were mixed feeding (9.0%). 97 children (89.4%) had a late introduction of complementary foods (vegetables, meat dishes) - from 8-9 months of age. In children who were artificially and mixed feeding, biscuits and cereals based on diluted cow's milk prevailed. Children from 1 to 3 years old also had significant nutritional errors. Attention was drawn to the predominance of flour, dairy, and plant foods in their diet; children received little meat products, vegetables, and fruits.

Analysis of the results obtained showed a pronounced effect of unbalanced feeding and nutrition on the development of anemia in the studied group of children.

Table 3 provides information on the incidence of clinical signs of anemia in children with IDA, taking into account the severity of the disease.

Table 3 shows the direct relationship between the incidence of clinical symptoms of IDA and the severity of the disease.

Based on the foregoing, the following conclusions can be drawn: iron deficiency anemia in young children with a high frequency was observed in children under 1 year of age, and the reasons for its development in all studied groups were endogenous and exogenous iron deficiency caused by various factors against the background of concomitant diseases (rickets, exudative - catarrhal diathesis, hypotrophy).

The clinical manifestations of iron deficiency and parental complaints were diverse. Among the complaints most often, parents reported pallor of the skin (177), lack of appetite (161), taste perversion - eating earth, clay, chalk (102), the appearance of frequent regurgitation (89), vomiting (34). An objective study revealed pallor of the skin and visible mucous membranes in all examined patients, dry skin (103), dry hair, hair loss (96), brittle and thinning nails (65). In children over a year old, changes in the oral mucosa were quite common in the form of atrophy of the papillae of the tongue - "polished" or "lacquered" tongue (84), so-called "seizures" in the corners of the mouth - angular stomatitis (52)

TABLE 3 THE FREQUENCY OF CLINICAL SYMPTOMS OF ANEMIA IN CHILDREN WITH VARYING DEGREES OF SEVERITY

Factors	Severity of anemia in children		
	Mild	Moderate	Severe
Pallor of the skin, mucous membranes; trophic disorders of hair, nails, skin; atrophy of the papillae of the tongue	- +	+ + +	+ + +
Anorexia, perversion of taste, smell; regurgitation, vomiting; angular stomatitis	- +	+ + +	+ + +
Changes in the cardiovascular system; gastrointestinal tract and other systems	+ -	+ + +	+ + +

One of the signs of iron deficiency in young children, especially in severe and moderate forms, was a lag in physical development indicators: 152 (77.9%) children were identified with signs of hypotrophy and hypocitraturia, while hypotrophy was observed mainly in 103 children under the age of 1 year (52.8%).

We noted deviations in psychomotor development, which were especially clearly manifested in the 1st year of life: children began to hold their heads late, sit, stand, walk, and later began to speak (111). In 164 children, a decrease in emotional tone, a rapid change in mood was revealed to one degree or another, the children were inactive, lethargic, whiny, capricious, a decrease in interest in the environment, toys. The observation results showed that organ function abnormalities were mainly related to the cardiovascular system (148), which boiled down to the presence of systolic murmur, tachycardia, and a slight expansion of the borders of the heart.

Hepatomegaly and enlargement of the spleen were found in 80 patients. Both organs were determined by palpation, the lower edge of which protruded from under the costal arch by 3.5-4 cm. Stool changes were not typical and constant. Constipation and unstable stool were noted with the same frequency.

The above clinical symptoms of iron deficiency in young children supplement laboratory studies characterizing the state of red blood and indicators of iron metabolism.

As can be seen from the presented table 4, characteristic changes in peripheral blood during IDA are a low level of hemoglobin, a decrease in its content in an individual erythrocyte, a decrease in the hematocrit value, a color index, and a decrease in the total number of erythrocytes. The iron deficiency nature of the identified anemia is confirmed by the data contained in table. 4: sideropenia, an increase in the total iron-binding capacity of blood serum and a significant decrease in the transferrin saturation coefficient.

TABLE 4 PARAMETERS OF PERIPHERAL BLOOD AND SERUM IRON METABOLISM IN CHILDREN WITH IDA AGED 3 MONTHS TO 3 YEARS.

№	Indicators	IDA of moderate severity (n = 70)	Severe IDA (n = 21)	Healthy children (n = 214)
1.	Hemoglobin,	79,0±1,62	64,6±2,3	129,0±1,8
2.	Erythrocytes, 10 ^{12/l}	3,26±0,12	2,81±0,08	4,41±0,07
3.	Hematocrit, vol%	26,3±0,76	22,5±0,9	34,8±0,4
4.	Average hemoglobin content in erythrocyte (PG)	22,4±0,06	21,0±0,03	33,2±0,04
5.	Color index, units	0,74±0,01	0,67±0,02	0,89±0,003
6.	Serum iron, µmol / L	8,7±0,07	3,4±0,02	20,2±0,5
7.	TIBC, µmol / L	89,8±0,8	97,4±0,6	60,8±0,02
8.	LVSS, µmol / L	52,1±0,4	100,3±4,0	33,0±0,01
9.	Transferrin saturation coefficient,%	11,8±0,07	8,0±0,05	38,7±0,15

Thus, the examination of sick children revealed the iron-deficient nature of anemia, as evidenced by a low level of serum iron, a low coefficient of saturation of transferrin with iron. In addition,

clinical data characterizing trophic changes in epithelial integuments, as well as hematological data in the form of pronounced hemolysis, with reduced actual erythropoiesis with a shortened erythrocyte life, speak eloquently about iron deficiency. Changes in the morphological properties of erythrocytes in the form of microcytosis, an increase in the thickness and volume of erythrocytes, hypochromia can also be evidence of the iron deficiency nature of anemia.

CONCLUSION

Treatment of all observed patients was carried out in a comprehensive manner, it was pathogenetic, systematic and consisted of measures aimed at eliminating the causes of the development of anemia and at eliminating the lack of iron in the body. The nutrition of sick children was strictly and individually organized. Vitamins and mineral salts of iron were introduced into the diet. Children of the first year are introduced to complementary foods earlier, including vegetable dishes and homogenized purees (vegetable with meat, vegetable with liver). The complex of treatment of children included intramuscular injections of vitamins B6, B1, 0.5-1.0 ml daily. Iron preparations were prescribed to young children, taking into account the content of the element, valence, tolerance, and the absence of side effects.

The study of the comparative therapeutic evaluation of the new composition of ferroceron in rosehip syrup made it possible to establish a high direct and persistent antianemic effect. The drug, which actively affects the processes of hemoglobin synthesis, stimulates erythropoiesis in the absence of toxic side effects. In the treatment of young children with iron deficiency anemia, ferroceron in syrup and rose hips, in comparison with other iron-containing drugs most often used in children, gives an increase in hemoglobin 1.5 times more and more than doubles its average daily growth, as well as under the influence ferroceron in rosehip syrup much earlier (by the end of 1 week) a reticulocytic crisis appears in children, its value was 1.5-2 times higher than in the group of children treated with other drugs, the normalization of the erythrocyte balance, the number of erythrocytes and indicators iron exchange.

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