



## IRON DEFICIENCY ANEMIA IN CHILDREN AND ITS TREATMENT.

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Article history:	Abstract:
<b>Received:</b> October 28 <sup>th</sup> 2024	According to WHO, the prevalence of IDA in young children ranges from 17.5 to 30%. The causes of iron deficiency in children are quite varied. The effectiveness of ferrotherapy is an integral indicator of two components - the therapeutic effectiveness in relieving anemic syndrome and the tolerability of a particular ferropreparation by patients. 55 children with IDA of 1-2 degrees aged 1 to 3 years were examined. The main group took ferrum-lek in grape juice (FVS) as monotherapy, the control group ferrum-lek in the form of syrup, without the addition of juice. The effectiveness of FVS was confirmed by the fact that already on the 15-20th day of treatment there was a certain regression of clinical symptoms and positive changes in the morphofunction of the erythrocyte system of sick children. The results obtained allow us to recommend FVS as an effective and safe herbal preparation for the treatment and prevention of IDA in children over 1 year old, and the bioavailability and bioavailability of FVS are significantly higher than those of iron preparations when taken orally.
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**RELEVANCE OF THE TOPIC.** Iron deficiency anemia (IDA) is one of the common forms of clinical pathology, occurring in every 5th inhabitant of the planet. The prevalence of IDA in young children according to WHO is from 17.5 to 30% [3,5]. The causes of iron deficiency in children are quite diverse and are associated with both insufficient iron intake and its increased consumption in the body. In this case, the main role is played by the unbalanced nutrition of the child with a limitation of meat dishes and excessive consumption of dairy and flour products. An important place among the causes of IDA is occupied by a violation of the transplacental passage of iron, which is observed in complicated pregnancies, multiple pregnancies, and in children born prematurely [1,2,4]. The effectiveness of ferrotherapy is an integral indicator of two components - the therapeutic effectiveness in stopping the anemic syndrome and the tolerability of a particular ferropreparation by patients. Practice shows that when minimal signs of intolerance appear, the patient, as a rule, refuses treatment with this drug. At the same time, both of these components, determining the effectiveness of ferrotherapy, in turn, are determined by a number of factors, namely, the ionic form of the active principle of iron, the dose of elemental iron contained in a particular drug, as well as its composition, i.e. a combination of iron with components that promote better digestibility and absorption of iron in the gastrointestinal tract [6,7,8]. Given the important role of the trace element iron in the body's vital functions, as well as the wide range of consequences of its deficiency, the problem of treating IDA remains relevant. The aim of our study is to replenish iron deficiency in IDA in children with the most highly effective, convenient and well-tolerated therapeutic agent to eliminate the consequences of this disease.

**Materials and methods of the study.** At the children's multidisciplinary medical center in the city of Samarkand, 55 children aged 1 to 3 years with IDA of 1-2 degrees were examined and treated. IDA was determined on the basis of clinical and hematological manifestations. Of the examined children, 35 patients were children of the main group: 15 patients with IDA of 1 degree and 20 patients with IDA of 2 degrees, who received the ferrum-lek syrup in grape juice (FVS) proposed by us as monotherapy. The control group included 20 patients (10 with 1 degree and 10 with 2 degree of anemia), who, along with complex therapy, received ferrum-lek in the form of syrup, without the addition of juice. In order to replenish iron deficiency, depending on the degree of anemia, based on the calculation of 2-3 mg

/ kg to 5-6 mg / kg of body weight, the course dose of oral administration of iron preparations was calculated. The effectiveness of our antianemic iron-containing drug was assessed based on the data on the increase in the level of total hemoglobin in the blood over a fixed period of time using the index of biological availability (IBA) using the formula:  $(\text{Hb after treatment} - \text{Hb before treatment}) \times 2500 \text{ IBA} = \text{total amount of iron taken}$

We calculated this index 3-4 weeks after the start of IDA treatment.

Results and discussions. We chose the iron-containing drug ferrum-lek in the form of syrup, since the iron in it is in a non-ionized form, this drug does not have side effects and can be used by mixing with grape juice. Sideropenia was corrected in two stages. The first stage of iron deficiency anemia treatment lasted 1 month, and the second stage lasted 2-3 months to replenish iron reserves in the child's body. At the first stage, the dose of pure iron was calculated at 5-6 mg / kg of body weight. At the second stage, the therapeutic dose was reduced by 1-2 times, i.e. about 2 mg / kg of the child's body weight.

Children of the main group were prescribed the ferrum-lek syrup in grape juice (FVS) proposed by us as monotherapy, its daily dose for mild IDA in children over 1 year old was 60 ml, for an average degree - 90 ml. In this case, patients received 50 to 55 mg of pure iron per day. During the course of therapy, the child received 2200 to 2500 mg of iron.

In this case, the dose of the drug was adjusted based on the fact that grape juice, being a healing substance, has a diuretic and mild laxative effect. In 100 ml of grape juice, the concentration of iron fluctuates between 1 and 2 mg% and it has a beneficial effect in the treatment of anemia, metabolic disorders and other diseases.

According to our results, FVS does not cause any side effects, which indicate good tolerability of FVS and its clinical effectiveness in the treatment of IDA of I and II degrees. The duration of treatment was determined by the time of disappearance of clinical symptoms and normalization of peripheral erythron indices, which averaged 2.5-3 months. The effectiveness of FVS was confirmed by the fact that already on the 15-20th day of treatment there was a certain regression of clinical symptoms and positive changes in the morphofunction of the erythrocyte system of sick children. The results of studies of 35 children using FVS showed that a positive clinical and hematological effect, characterized by an improvement in the general condition, appetite, pinkness of the skin, the disappearance of tachycardia and systolic murmur, positive changes in the number of erythrocytes in their morphostructure occurred on the 15-20th day of treatment in 23 (76.6%) patients. When assessing the clinical effectiveness of treatment, attention was paid to the dynamics of changes in the well-being of patients: the emotional status of the child, the color of the skin and mucous membranes, muscle tone, the presence of dyspeptic phenomena, their constancy, etc. were taken into account. In this case, no intolerance to FVS was observed, which was given in a slightly smaller dose on the first day of administration (depending on age and individual characteristics) with an increase to 50-60 ml in 2-3 days. It should be noted that for most children (94.2%) this period was quite sufficient to fully adapt to the taste properties of FVS. As our observations showed, FVS was well tolerated by children, without causing an increase in the dyspeptic symptoms present in some patients. The observed patients had changes in skin color depending on the duration and severity of the disease. In most cases, patients had pallor, and sometimes with a pale cyanotic tint of the skin and mucous membranes. If we take into account the total before treatment, pallor of the skin was noted in 77.48% and 91.44% of the control group, respectively, at the end of the complex treatment in most children in both the main and control groups,

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restoration of skin color was observed, but in the main group it occurred 2-3 days earlier than in the control group.

One of the important indicators of the effectiveness of treatment and the adequacy of nutrition of a sick child is weight gain.

This indicator is an important criterion characterizing the biological properties of the test product to justify its use in children with IDA. The clinical effectiveness of any antianemic iron-containing drug is assessed by the dynamics of the increase in the level of total hemoglobin in the blood over a fixed period of time. An indicator such as IBU based on the dynamics of the increase in hemoglobin levels allows us to determine the bioavailability of iron from various oral iron-containing substances, which is indicated in Table 1. This indicator is an important criterion characterizing the biological properties of the test product to justify its use in children with IDA. The clinical effectiveness of any

Время терапии	21 день
Уровень Нб до лечения	92,40±1,20
Уровень Нб после лечения	104,10±2,71*
110,15±1,75	
Общая доза полученного железа	1092 мг
ИБУ 26,8	
40,6	

\*Примечание: -в числителе контрольная группа, в знаменателе основная группа.

		96,26±1,18	110,15±1,75	<0,001	116,07±2,17	>0,05
3	Ретикулоциты, %	11,08±0,27	7,05±0,21	<0,001	5,10±0,18	<0,001
		11,47±1,23	5,91±0,60	<0,001	4,15±0,72	<0,1
4	Гематокрит	0,34±0,03	0,32±0,02	>0,01	0,33±0,03	>0,1
		0,34±0,05	0,34±0,03	>0,1	0,35±0,04	>0,1

\*Примечание : в числителе – контрольная, в знаменателе – основная группа P<sub>1</sub> – достоверность с группой больных на пред выпиской, P<sub>2</sub> – с группой, спустя 3-4 недели.

antianemic iron-containing drug is assessed by the dynamics of the increase in the level of total hemoglobin in the blood over a fixed period of time. An indicator such as IBU based on the dynamics of the increase in hemoglobin levels allows us to determine the bioavailability of iron from various oral iron-containing substances, which is indicated in Table 1.

As can be seen from the table, the hemoglobin concentration in the erythrocyte when giving FVS tends to normalize the indicators after the treatment.

It is known that one of the main reasons for the development of IDA in children is insufficient iron intake with food and its incomplete absorption, since the presence of hypochromia, macrocytosis, aniso-poikilocytosis are characteristic signs that do not contradict its deficient genesis. Therefore, we associate a significant improvement in the morphology of erythrocytes in children with a higher absorption of iron contained in FVS.

Table 2 shows an example of the effectiveness of FVS, based on the calculation of the IBU of iron of this combination in the treatment of patients with IDA (Table 2).

Table 2.

Table 2. The effectiveness of FVS based on the calculation of the IBU of iron.

Inclusion of ferrum-lek in syrup together with grape juice in the arsenal of complex therapy developing against the background of IDA of I and II degrees has a high efficiency for normalizing sideropenia. Complete normalization of ferritin status occurs in 2.5-3 months of treatment, the index of biological availability of iron syrup diluted in grape juice is 1.5 times higher than without dilution. Complete normalization of ferritin status occurs in 2.5-3 months of treatment, which indicates the feasibility of long-term ferrotherapy, especially IDA of I and II degrees. An important feature of FVS is good tolerability, high availability and absence of side effects. The obtained results allow us to recommend FVS as an effective and safe herbal remedy for the treatment and prevention of IDA in children over 1 year old, and the bioavailability and bioavailability of FVS are significantly higher than those of iron preparations when taken orally. Conclusions. Thus, the complex therapy of IDA in children over 1 year of age, the drug FVS, is a highly effective, easy-to-use and well-tolerated therapeutic agent that can be recommended for the correction of sideropenia at home in children of any age

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