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COMPARATIVE ANALYSIS OF THE EFFECTIVENESS OF PARENTERAL DRUGS IN THE TREATMENT OF IRON DEFICIENCY ANEMIA IN PREGNANT WOMEN

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Abstract:
To compare the effectiveness, tolerability and safety of intravenous iron carboxymaltose (ICM) and intravenous iron sucrose for the treatment of moderate iron deficiency anemia in pregnant women

Keywords:

Anemia is one of the serious and common problems in the field of obstetrics, as the presence of anemia during pregnancy significantly aggravates the course of the gestational process and causes a number of complications during childbirth and the postpartum period [1–3]. It is known that, depending on its severity, anemia is an important risk factor for death for the mother and fetus. One of the global goals of United Nations is to reduce the prevalence of anemia in women of reproductive age by 50% by 2025 [4]. In a large Indonesian study, the incidence of maternal mortality with hemoglobin <100 g/L was 70.0 per 10,000 births compared with 19.7 per 10,000 births for women without anemia [5]. The World Health Organization (WHO) has defined the threshold for anemia during pregnancy as a hemoglobin (Hb) level of less than 110 g/L in the first and third trimesters and less than 105 g/L in the second trimester.

In Uzbekistan, the main etiological form of anemia in pregnant women, accounting for up to 90% of all cases, is iron deficiency anemia and is found in 80% of pregnant women and 60% of women of fertile age [6,7]. For moderate severity of IDA in the second and third trimesters of pregnancy, according to the IDA treatment protocol, parenteral iron preparations are prescribed, which are mainly aimed at high and long-term effectiveness; one of these drugs is trivalent carboxymaltose iron solution (the drug Ferinject), which allows delivering more high doses of iron in a shorter period of time.

OBJECTIVE: To compare the effectiveness, tolerability and safety of intravenous iron carboxymaltose (ICM) and intravenous iron sucrose for the treatment of moderate iron deficiency anemia in pregnant women.

RESEARCH METHODS: A total of 75 pregnant women in the 2nd and 3rd trimesters with a hemoglobin level of 71-91 g/l were selected. The main group consisted of 35 women who received iron carboxymaltose, a comparison group of 45 pregnant women received iron sucrose of the drug Venofer 10 ml (200 mg of iron), administered intravenously for at least 10 minutes 3 times a week. The age and parity were comparable in both groups (21-35 years). A complete hemogram and serum ferritin data were sent to each patient before iron supplementation and also after 4 weeks. The iron preparation III carboxymaltose Ferinject was prescribed, which was administered 1000 mg in saline solution for 30-40 minutes, after 5-6 days 500 mg in saline solution intravenously for 30 minutes. Efficiency indicators were laboratory examinations of pregnant women, which included clinical blood tests, a biochemical blood test with determination of serum iron, ferritin, transferrin, and also used a questionnaire for a comparative assessment of clinical symptoms in patients.

RESULTS:
In the ICM group, the average increase in hemoglobin was approximately 23.61 from 88.76 to 112.37 g/l, while in the iron-sucrose group it increased from the initial value of 90.78 g/l to 102.8 and amounted to (12. 02 g/l) for a month. In the iron-sucrose group, serum ferritin increased compared to the baseline level (from 14.35 to 31.3 μg/L), while in the main group the increase in ferritin level was from 12.44 to 42.8 (Table 1). Reactions in both groups were mild, with 17.1% in the iron-sucrose group experiencing adverse reactions, whereas only 8.5% of women in the ICM group experienced mild adverse reactions.

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ANEMIA DEFICIT TEST

Table 1.

Indicators	Main group		Comparison group	
	Before treatment	After one month	Before treatment	After one month
Hemoglobin, g/l	88,76±1,4	112,37±1,2	90,78±1,0	102,8±1,4
Red blood cells $^{x}10^{12}$/л	3,49±0,38	3,99±8,73	3,75±0,3	3,81±0,3
Platelets	252,37±7,9	213,09±6,7	228,54±9,3	219,67±7,9
Hematocrit, %	29,54±0,3	34,81±0,3	31,04±0,3	31,63±0,4
Serum iron, μmol/l	6,67±2,5	21,45±2,8	9,78±1,4	14,35±1,6
Ferritin, μg/l	8,44±2,7	42,8±17,4	8,75±1,8	36,3±16,0
Transferrin, g/l	4,55±1,06	2,99±1,0	4,11±1,08	4,18±1,0
*Clinical symptoms in %	72±1,8	28±1,5	71±1,2	38,5±1,6

Subjective and objective indicators indicated both a good antianemic effect of the drug and good tolerability, so as a result of the questionnaire of pregnant women on subjective indicators there was an improvement from 72% of deep deficiency after treatment in the main group to 28% without deficiency and a more pronounced improvement in quality of life was noted, whereas in the comparison group the rates ranged from 71% to 38.5% (Table 2).

Anemia Deficiency Test	
1.	**Do you have dry, flaky or dark spots on your skin?** **o yes** **o no**
2.	**Is your hair falling out?** **o yes** **o no**
3.	**Do you have cracked or red heels?** **o yes** **o no**
4.	**Are you worried about chronic fatigue or lack of energy for everyday activities?** **o yes** **o no**
5.	**Do you often find it difficult to fall asleep with thoughts swirling in your head and/or do you regularly wake up at night and cannot fall back to sleep for 1-2 hours?** **o yes** **o no**
6.	**Do you have discomfort in your legs in the evening that makes it difficult to sleep (restless legs syndrome)?** **o yes** **o no**
7.	**Do you often feel anxious or irritated?** **o yes** **o no**
8.	**Do you find it difficult to concentrate, maintain attention, or remember new information?** **o yes** **o no**
9.	**Are you bothered by a pronounced, almost irresistible craving for sweets?** **o yes** **o no**

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10.	**Would you like to play sports, but never have the energy to do it?** **o yes** **o no**
	Interpretation of the test result: **0-30% - perhaps you are just tired and haven't gotten enough sleep for a long time. Get plenty of rest. Try to go to bed before 23:00. Eat healthy and varied foods. Be physically active. If you are planning a pregnancy or are already pregnant, it is worth taking a general blood test and a ferritin test in order to think through individual prevention of iron deficiency during this period.** **30-70% - hidden iron deficiency is very likely. It can exist even with normal blood counts. Get tested for ferritin and see your doctor.** **70-100% - you have symptoms of severe iron deficiency. You may already have anemia. Don't put off going to the doctor. Get a complete blood count and ferritin test as soon as possible.**

CONCLUSION: When comparing two intravenous iron preparations, women in the ICM group had more severe symptoms. The ICM group showed better and more rapid improvement in hemoglobin, serum ferritin and fewer adverse reactions. ICM appears to be clinically more effective and safe than iron sucrose in the treatment of pregnant women with iron deficiency anemia. There was improvement in hemoglobin, serum ferritin and blood counts in both the ferrous sucrose and ICM groups, but this was achieved more quickly and effectively with ferrous caboxymaltose compared with ferrous sucrose. The required dose is almost 1000 mg in both groups. For iron-sucrose, only 200 mg can be taken at a time. Thus, patients in the iron sucrose group require at least five visits to receive the required dose, which reduces patient adherence to treatment and increases the number of hospital visits. Whereas in the ICM group, 1000 mg and 500 mg can be administered twice.

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