

Anemia and First Pregnancy: the Necessity of Treatment and Prevention

Akhmedova A.T¹, Bozorova D², Tuichieva N.³

^{1,2,3} Samarkand State Medical University

Abstract:

Iron deficiency anemia (IDA) is one of the most common complications during pregnancy, significantly impacting both maternal and fetal health. First-time pregnancies (primigravida) are particularly vulnerable due to unadapted iron reserves and increased physiological demands. The study examines the prevalence, risk factors, prevention, and treatment strategies for IDA in pregnant women, with a focus on Uzbekistan. The findings indicate that iron deficiency increases the risk of obstetric complications, including preterm birth, fetal growth restriction, and postpartum hemorrhage. The research highlights the importance of early screening and iron supplementation, particularly with modern, sustained-release formulations, to enhance treatment efficacy and improve pregnancy outcomes. Clinical trials demonstrate that the use of prolonged-release iron supplements effectively increases hemoglobin levels, improves maternal well-being, and reduces the incidence of perinatal complications. Addressing IDA through timely diagnosis and intervention is essential for optimizing maternal and neonatal health, reinforcing the need for comprehensive iron deficiency prevention programs.

Keywords: Iron deficiency anemia, pregnancy, primigravida, maternal health, perinatal complications, fetal development, iron supplementation, hemoglobin, obstetric outcomes, prenatal screening.

Introduction

Iron deficiency anemia (IDA) during pregnancy is one of the most prevalent and significant complications affecting both maternal and fetal health. According to the World Health Organization (WHO), over 40% of pregnant women worldwide suffer from anemia, with the highest prevalence in developing countries. IDA is associated with an increased risk of preterm birth, low birth weight, intrauterine growth restriction, and perinatal mortality.

During pregnancy, iron demand increases by 1.5–2 times, particularly in the second and third trimesters, due to enhanced erythropoiesis and fetal development. First-time pregnancies (primigravida women) are at higher risk due to unadapted maternal physiological reserves and possible pre-existing iron deficiency. If left untreated, IDA can lead to serious complications, including placental insufficiency, chronic fetal hypoxia, and an increased risk of postpartum hemorrhage.

In Uzbekistan, the prevalence of anemia in pregnant women remains high, affecting 35.5% of expectant mothers, with contributing factors such as nutritional deficiencies, high birth rates, and limited awareness of preventive measures. National programs have been introduced to enhance iron supplementation strategies, yet adherence to these recommendations remains suboptimal, making IDA a persistent public health issue.

Given the significant impact of anemia on pregnancy outcomes, early screening, prevention, and treatment are crucial. The use of modern, highly bioavailable iron supplements with prolonged release has demonstrated better efficacy and tolerability, leading to improved pregnancy outcomes and maternal well-being. Addressing iron deficiency in pregnancy not only ensures safer gestation and delivery but also reduces the risk of neonatal anemia and developmental delays in infants.

Thus, the study of iron deficiency in first-time pregnancies, its prevention, and treatment strategies remains an urgent issue, requiring comprehensive approaches that integrate screening, early diagnosis, and effective iron supplementation protocols to improve maternal and perinatal health.

Method

The total amount of iron in the human body ranges from 2 to 6 g. Hemoglobin-bound iron accounts for 65%, stored iron (ferritin) makes up 20%, myoglobin contains 10%, 5% is present in enzymes, and transferrin (transport iron) represents only 0.1% [1,2]. Iron deficiency conditions (IDC) result from disrupted iron metabolism due to its deficiency and are characterized by clinical and laboratory signs, the severity of which depends on the degree of iron depletion.

Currently, IDC is classified into pre-latent iron deficiency (PLID), latent iron deficiency (LID), and manifest iron deficiency, also known as iron deficiency anemia (IDA). PLID and LID are characterized by reduced stored and transport iron while maintaining erythrocytic iron levels [3,4]. PLID typically develops by the end of the third trimester of pregnancy and is marked by a decrease in iron metabolism indicators within normal limits without clinical or biochemical signs of iron deficiency. The Fe^{3+} absorption test can help detect PLID. In 60% of cases, iron absorption exceeds 50%, compared to the normal range of 10–15% [1,5–7].

LID is characterized by tissue iron deficiency without clinical symptoms, with a significant reduction in iron reserves and erythropoietin (EPO) levels. It most commonly occurs between the 19th and 24th weeks of pregnancy. Without iron supplementation, 65% of pregnant women with LID develop IDA, leading to an increased risk of pregnancy complications [2,7,8].

Manifest iron deficiency, or IDA, is a hematological syndrome characterized by impaired hemoglobin synthesis due to iron deficiency, as well as dysfunctions in various organs and tissues. IDA affects all iron metabolism reserves—functional, transport, storage, and regulatory—leading to an increased risk of obstetric complications [9,10]. According to the WHO, IDC is the most common pathology worldwide after respiratory viral infections. The prevalence of PLID and LID globally reaches 92%, while IDA affects 25–50% of pregnant women. In developed countries, IDA prevalence is 18–20%, whereas in developing countries it ranges from 35% to 75%. In Russia, the prevalence of IDA is 34.7% [2,9,11,12].

Pregnancy significantly increases iron demand:

- First trimester: 16% increase
- Second trimester: 59% increase
- Third trimester: 67% increase

During pregnancy and postpartum, approximately 1,400 mg of iron is utilized:

- 500 mg for increased erythropoiesis
- 300 mg for fetal-placental system development (fetus: 280–290 mg, placenta: 25–100 mg)
- 190 mg for ongoing metabolic consumption
- 230 mg lost during delivery
- 400 mg for lactation

The clinical presentation of IDA in pregnant women is influenced by anemia-related symptoms and sideropenic syndrome (iron deficiency in the body) [1,13,14]. Common non-specific symptoms include fatigue, dizziness, tinnitus, rapid exhaustion, drowsiness, hypotension, orthostatic hypotension, lipotemia, tachycardia, and exertional dyspnea.

Result and Discussion

Anemia in Primigravida Women

Anemia in first-time pregnancies is a widespread issue that can lead to severe consequences for both mother and fetus. A study published in the *American Journal of Obstetrics and Gynecology* (2015) found that hemoglobin levels below 11 g/dL were observed in 21% of primigravid women, with increased risk correlating to maternal age and body mass index (BMI). These findings highlight the importance of regular hemoglobin screening and early intervention.

In Uzbekistan, anemia among pregnant women remains a significant problem. According to the National Statistics Center of Uzbekistan (2019), 35.5% of pregnant women were diagnosed with anemia. Contributing factors include poor nutrition, iron and vitamin deficiencies, infections, and comorbidities. The country has implemented national programs such as "Maternal and Child Health Preservation," providing nutrition guidelines, iron supplementation, and disease prevention strategies. Educational programs for expectant mothers emphasize proper nutrition and prenatal care, with consultations and supplementation programs available.

Multicenter studies confirm that 70% of an infant's hemoglobin originates from maternal stores, explaining why 68% of children under one year born to mothers with IDA also develop iron deficiency anemia. IDA in pregnancy adversely affects cognitive, motor, and speech development, impairs metabolism, and weakens immune function in infancy [2,10,15].

Diagnosis and Prevention

Hematological and iron metabolism indicators are essential for diagnosing IDA in pregnancy [2,16]. Given the high prevalence of obstetric and perinatal complications associated with iron deficiency, preventing maternal anemia is a priority. Since 2012, WHO recommends daily prophylactic intake of 30–60 mg of elemental iron for all pregnant women [12]. The American College of Obstetricians and Gynecologists (2021) also endorses early iron supplementation.

High-risk groups requiring preventive iron therapy include:

- Women with heavy or prolonged menstruation before pregnancy
- Pregnancy intervals ≤ 2 years
- Multiple pregnancies

- Extended breastfeeding after previous childbirth

Iron screening is recommended from the 5th–6th week of pregnancy, preferably with combination therapy of iron and folic acid supplements [2,3,7,10,18].

Treatment of IDA

Effective IDA therapy requires iron supplementation, as dietary intake alone is insufficient. WHO defines IDA severity by hemoglobin (Hb) levels:

- Mild anemia: Hb 90–110 g/L
- Moderate anemia: Hb 70–89 g/L
- Severe anemia: Hb <70 g/L

Intravenous iron therapy is indicated for moderate to severe anemia, particularly in the second trimester if oral supplementation is ineffective or intolerable. Hemoglobin should increase by 10 g/L within 3–4 weeks during pregnancy. Treatment should continue at least 3 months postpartum to restore iron reserves [22,24].

Clinical Study on Iron Supplementation

A study was conducted on 120 pregnant women (gestational age: 14–28 weeks, mean age: 22±5 years) who received a 4-week treatment course of Sorbifer Durules. The maximum safe single dose of elemental iron was 100 mg, with a daily limit of 300 mg.

Sorbifer Durules has a sustained-release formulation, preventing gastric mucosal irritation by releasing iron only in the duodenum, ensuring optimal absorption over 6 hours [19]. This formulation results in higher hemoglobin increases compared to standard iron supplements, particularly in severe anemia cases [20].

Study Results

- 36.4% of participants had mild IDA
- 27.3% had moderate IDA
- 18.2% had severe IDA

Before treatment, 36% of patients reported fatigue, 18% had palpitations, and 46% exhibited tissue iron deficiency signs (koilonychia, dysphagia, gastric secretion issues). By week 2, hemoglobin levels had significantly increased, and hematocrit improved from 26.8±1.3% to 39.0±2.5% after treatment.

Patient-reported outcomes after 4 weeks:

- 54% reported significant improvement
- 55% had no symptoms
- 18% still experienced fatigue
- 18% had mild tissue iron deficiency
- 9% had palpitations

Conclusion

IDA is a common and serious condition in pregnant women, particularly in first-time pregnancies. Early screening and timely iron supplementation significantly reduce pregnancy complications and improve maternal and fetal health outcomes. Sustained-release iron formulations like Sorbifer

Durules offer superior absorption and patient tolerability, making them a preferred choice for IDA management in pregnancy

LITERATURE

1. Рациональная фармакотерапия в акушерстве, гинекологии и неонатологии = Rationale for drug therapy in obstetrics, gynecology and neonatology: в 2 т.: руководство для практикующих врачей. Под ред. В.Н. Серова, Г.Т. Сухих. 2-е изд., испр. и доп. М.: Литтерра, 2010 (Рациональная фармакотерапия).
2. Диагностика и лечение в гинекологии: проблемный подход. М. Рис [и др.]; пер. с англ.; под ред. В.Н. Прилепской. М.: ГЭОТАР-Медиа, 2010.
3. Прилепская В.Н., Яглов В.В. Лечение анемии у женщин с маточными кровотечениями. Фарматека, 2003, 2: 7-12.
4. Серов В.Н., Бурлев В.А., Коноводова Е.Н., Жаров Е.В. Железодефицитные состояния у беременных. Серия научно-практических информационных и дискуссионных материалов. Российский клинический опыт для акушеров-гинекологов. М., 2005.
5. Коноводова Е.Н., Бурлев В.А., Серов В.Н., Кан Н.Е., Тютюнник В.Л. Диагностика, профилактика и лечение железодефицитных состояний у беременных и родильниц. Федеральные клинические рекомендации. Российское общество акушеров-гинекологов ФГБУ «НЦ АГиП им. В.И. Кулакова» МЗ России, 2013. С. 26.
6. Серов В.Н., Шаповаленко С.А. Диагностика и лечение железодефицитных анемий у беременных. МРЖ, 2005, 17: 1143.
7. Коноводова Е.Н., Бурлев В.А., Шаков Р.Г. Профилактика и лечение железодефицитных состояний у беременных и родильниц. Гинекология, 2010, 3: 24-31.
8. Малоч А.В., Анастасевич Л.А., Филатова Н.Н. Железодефицитные состояния и железодефицитная анемия у женщин детородного возраста. Лечащий врач, 2013, 4
9. Бурлев В.А., Коноводова Е.Н., Орджоникидзе Н.В., Серов В.Н., Елохина Т.Б., Ильясова Н.А. Лечение латентного дефицита железа и железодефицитной анемии у беременных. Российский вестник акушера-гинеколога, 2006, 1: 64-68.
10. Коноводова Е.Н. Железодефицитные состояния у беременных и родильниц (патогенез, диагностика, профилактика, лечение). Автореф. дисс. ... д-ра мед. наук. М., 2008.
11. Хитров М.В., Охупкин М.Б., Ильяшенко И.Н. Анемия беременных. Пособие для врачей и интернов. 2-е изд., перераб. и доп. Ярославль, 2002.
12. Основные показатели деятельности службы охраны здоровья матери и ребенка в Российской Федерации. Под ред. академика РАМН Г.Т. Сухих, академика РАМН Л.В. Адамян. М., 2009.
13. Серов В.Н., Бурлев В.А., Коноводова Е.Н. и соавт. Железодефицитные состояния у беременных и родильниц. Учебное пособие. Под ред. академика РАМН Г.Т. Сухих и проф. Т.А. Протопоповой. М., 2009.
14. Ледина А.В. Растительные препараты в лечении железодефицитных анемий (обзор литературы). Гинекология. 2004, 5: 222-227.
15. WHO: The world health report 2002 — Reducing Risks, Promoting Healthy Life.
16. Breymann C., Krafft A. Treatment of iron deficiency anemia in pregnancy and postpartum. Transfusion Alternatives in Transfusion Medicine, 2012, Dec., 12 (3-4): 135-142.

17. Иванян А.Н., Никифорович И.И., Литвинов А.В. Современный взгляд на анемию у беременных. Российский вестник акушера-гинеколога, 2009, 1: 17-20.
18. Агабабян Л. Р., Ахмедова А. Т., Актамова Н. Прогнозирование и профилактика гнойно-септических заболеваний у беременных с заболеваниями полости рта (обзор литературы) //ЖУРНАЛ РЕПРОДУКТИВНОГО ЗДОРОВЬЯ И УРО-НЕФРОЛОГИЧЕСКИХ ИССЛЕДОВАНИЙ. – 2022. – Т. 3. – №. 4.
19. Агабабян Л. Р., Ахмедова А. Т. Возможности коррекции климактерических расстройств у женщин с противопоказанием к заместительной гормональной терапии //Проблемы репродукции. – 2017. – Т. 23. – №. 3. – С. 108-110.
20. Агабабян Л. Р., Насирова З. А. Послеабортный уход-особенности контрацепции //Фундаментальные и прикладные исследования науки XXI века. Шаг в будущее. – 2017. – С. 48-50.
21. Ахмедова А. Т., Шамсиддинова Д., Мирзаева Г. А. ХРОНИЧЕСКАЯ ГИПОХРОМНАЯ АНЕМИЯ ПРИ ПЕРВОЙ БЕРЕМЕННОСТИ-ОСОБЕННОСТИ ТЕЧЕНИЯ //Развитие и инновации в науке. – 2024. – Т. 3. – №. 10. – С. 72-75.
22. Агабабян Л. Р., Гайибов С. С., Носирова З. А. Особенности течения медикаментозного прерывания беременности у женщин с рубцом на матке //International scientific review. – 2017. – №. 2 (33). – С. 102-103.
23. Агабабян Л. Р. и др. Особенности чистопрогестиновой контрацепции у женщин с преэклампсией/эклампсией //Вопросы науки и образования. – 2019. – №. 26 (75). – С. 70-76.
24. Агабабян Л. Р. и др. Негормональная коррекция климактерических расстройств у женщин с эндометриозом //Вопросы науки и образования. – 2019. – №. 26 (75). – С. 77-84.
25. Ахмедова А. Т. Камалов А. И., Хушбекова Д. ОСОБЕННОСТИ АНЕМИИ У БЕРЕМЕННЫХ ЖЕНЩИН //Miasto Przyszłości. – 2024. – Т. 53. – С. 369-373.
26. Ахмедова А. Т. ОСОБЕННОСТИ ТЕЧЕНИЯ ПЕРВОЙ БЕРЕМЕННОСТИ КОМОРБИДНОЙ С ЖЕЛЕЗОДЕФИЦИТНОЙ АНЕМИЕЙ //International journal of scientific researchers (IJSR) INDEXING. – 2024. – Т. 5. – №. 2. – С. 846-850.
27. Ахмедова А. Т. и др. ОСОБЕННОСТИ АНЕМИИ У ПЕРВОБЕРЕМЕННЫХ //CONFERENCE ON THE ROLE AND IMPORTANCE OF SCIENCE IN THE MODERN WORLD. – 2024. – Т. 1. – №. 1. – С. 156-158.
28. Ахмедова А. Т., Муинова З. М. ПЕРВАЯ БЕРЕМЕННОСТЬ И СОМАТИЧЕСКАЯ КОМОРБИДНОСТЬ //Miasto Przyszłości. – 2024. – Т. 48. – С. 1744-1747.
29. Насирова З. А., Агабабян Л. Р. Постплацентарное введение внутриматочных спиралей у женщин, родоразрешенных абдоминальным путем //Проблемы репродукции. – 2017. – Т. 23. – №. 2. – С. 81-83.
30. Насирова З. А., Агабабян Л. Р. Современные взгляды на эффективность и приемлемость различных методов контрацепции после кесарева сечения //Вестник науки и образования. – 2020. – №. 12-3 (90). – С. 103-109.
31. Nasirova Z. A., Agababyan L. R. Reproductive behavior of women after cesarean section //International scientific review. – 2020. – №. LXX. – С. 88-92.

32. Агабабян Л. Р. Насырова З. А. Орипова Д. Б. Дистанционное наблюдение за беременными в условиях пандемии COVID-19 // Медицинское образование сегодня. – 2020. – Т. 3. – №. 11. – С. 115-25.