



## Review of anaemia in pregnancy

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### ABSTRACT

Pregnancy-induced Anemia is the most prevalent disorder caused by nutritional deficiencies recognized globally. The study aims to control Anemia in expectant mothers and ascertain how it affects the health of the mother and fetus. Anaemia is linked to higher rates of maternal and neonatal morbidity and mortality and ranges from 65% to 75% in India, 51% in underdeveloped nations, and 14% in wealthy countries (from 2000 to 2019, the prevalence has decreased by 19.6%). Numerous epidemiological studies have already remarked on the seriousness of the issue. According to studies, the increase in blood volume during pregnancy results in the body's total body iron reserves being depleted. Anemia in pregnant women is brought on by several risk factors, which can result in several complications such as preterm labor, placental abruption, etc.; for the optimal diagnosis, a complete blood count is preferred, and also measurement of serum ferritin has the highest sensitivity and specificity. The primary form of treatment for PIA is oral iron therapy (Ferrous sulfate, ferrous fumarate, ferrous gluconate.). Intravenous (IV) iron therapy (Iron dextran, Iron sucrose.) is a different therapeutic option for individuals who do not react to oral iron therapy. A well-planned nutritious diet which iron, folic acid, and vit.B.12 (red meat, beans, jaggery, cereals, strawberries, etc.) are necessary to prevent such anemic conditions. Lack of medication adherence by the patient is the most often noted risk factor for anemia advancement, even after a precise diagnosis and prescription.



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### INTRODUCTION

Anemia is the most common nutritional deficiency disorder and the most frequently seen in gestational women. It is a condition of lacking healthy red blood cells that carry oxygen.

#### **Anemia includes several types: [1-3]**

**Iron deficiency anemia:** It occurs due to low intake of iron-rich foods or due to excessive loss of iron by heavy menstruation flow, bleeding disorders, a growing fetus, etc.,

**Megaloblastic Anemia:** It is a hereditary disease that is characterized by the presence of distinctive

morphological appearance of extensive, abnormal, and immature red blood cells called megaloblasts by the bone marrow, which are released into the blood.

**Pernicious Anemia:** It is an autoimmune condition that causes the stomach to be unable to absorb vitamin B12 in the small intestine

**Hemorrhagic Anemia** occurs due to excessive RBC loss through bleeding, stomach ulcers, and menstruation.

**Hemolytic Anemia:** Due to rupture of RBC plasma membrane because of toxins, parasites, and antibodies.

**Thalassemia** is an inherited condition that results in abnormal hemoglobin formation.

**Sickle cell anemia** is a hereditary disorder in which red blood cells are rigid and sickle-shaped.

**Aplastic Anemia:** It is a condition that occurs due to the destruction of red bone marrow by toxins and gamma radiation

There are also other names, such as Normochromic Normocytic Anemia (normal MCHC, normal MCV) which includes hemolytic and aplastic Anemia, and Hypochromic Microcytic Anemia (low MCHC and low MCV), which provides for thalassemia, iron deficiency anemia, and Normochromic Macrocytic Anemia (normal MCHC and high MCV) which includes vitamin B12 and folate deficiency anemia.

### **Pregnancy induced Anemia**

World Health Organization defined Anemia in pregnancy as a hemoglobin concentration less than 11gdl and hematocrit <33%. During pregnancy, the plasma volume rises by approximately 50% or 1200ml. Most of the increase occurs before the 32<sup>nd</sup> to 34<sup>th</sup> week of gestation, and there may be minor changes beyond that. This condition is called Physiologic Anemia.

During pregnancy, a woman needs about 1000 mg of iron, of which 500 to 600 mg are required for RBC enlargement, 300 mg is necessary for the fetus and placenta, and the remaining amount is used to support the developing uterus. Due to the common occurrence of amenorrhea during pregnancy, approximately 850 mg of additional iron is needed. Even then, 500 mg of iron is lost, which cannot be made up via food alone. The most typical kind of Anemia in pregnancy, IDA, appears if iron reserves are already inadequate. Anemia in pregnancy is present in a very high percentage of pregnant women in India

The healthy range for hemoglobin is: For men, 13.2 to 16.6 grams per deciliter. For women, 11.6 to 15 grams per deciliter. World health organization

has accepted up to 11gdl as the average hemoglobin level in pregnancy

In India, 45.7 of pregnant women in urban areas and 52.1% in rural areas have hemoglobin levels less than 11gm%.

The prevalence of pregnancy-induced Anemia in developed countries is 14%, in developing countries 51%, and in India, it varies from 65% to 75%, as seen in Figure 1.

### **Causes [4–6]**

Inadequate consumption of dietary iron, RBC expansion and subsequent hemodilution, inadequate iron reserve before conception, repeated and closely spaced pregnancies, prolonged lactation, severe blood loss, worm infestation, GI bleeding, heavy menstruation, recurrent infections such as UTI, Nutritional deficiency, malabsorption of iron, bone marrow failure, blood disorders, increased destruction of RBC (hemolysis), excessive consumption of iron inhibitors (tea, coffee), decreased erythropoietin synthesis, inflammation and malignancy, hematuria

Mainly there are 3 types of pathologic Anemia seen in pregnancy: -

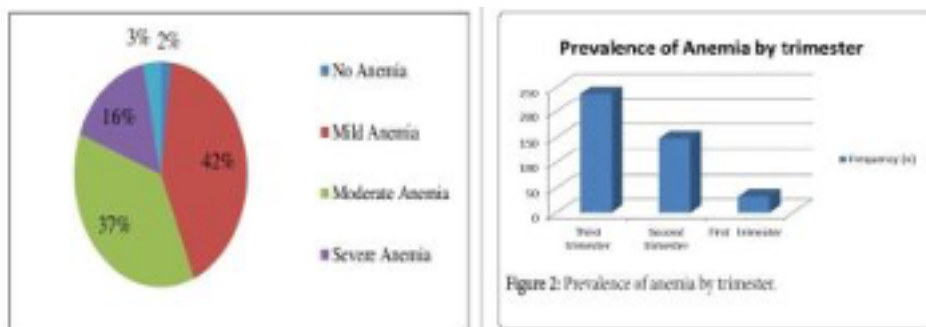
- Iron deficiency anemia
- Vitamin B12 deficiency anemia
- Folate deficiency anemia

**Iron deficiency anemia [IDA]:** This is a type of Anemia seen when the body doesn't have enough iron stores, as the body uses iron to make hemoglobin, and hemoglobin is a protein in RBC that carries oxygen to the tissues during pregnancy the volume of blood increases and so it requires more iron this leads to iron deficiency anemia. Severe IDA in pregnancy leads to premature birth (delivery before 37 weeks), lower birth weight of baby, and post partum depression.

**The iron requirement in pregnancy:** Total iron requirement is 1000mg

- Fetus and placenta—300mg
- Increased red cell mass-500mg
- Basal loss (shed through gut, skin, urine) — 200mg

**Vitamin B12 deficiency anemia:** This is due to a lack of vitamin B12 (cobalamin) which helps to produce healthy RBCs. This condition may lead to congenital disabilities in babies and neural tube abnormalities. It is most commonly seen in persons who



**Figure 1: a) BarGraph of Anemia b) Prevalence of Anemia**

do not consume any of the products coming from animals (vegans) such as milk, eggs, meat and poultry. Strict vegans often need vitamin B12 shots during pregnancy.

A kind of Anemia associated with a lack of vitamin B12 is called Pernicious Anemia. This Anemia affects 15-25% of elderly persons with vitamin B12 insufficiency. Even if a person is taking enough vitamin B12, pernicious Anemia can limit the absorption of the vitamin. Pernicious Anemia affects around 151 out of every 100,000 persons in the United States, and it is more prevalent in women and those with a European heritage. It is the leading global contributor to vitamin B12 deficiency.

**Folate deficiency anemia:** Folate is a B vitamin that works with iron to produce new and healthy blood cells. Since folate is essential for the baby's development, humans need larger doses of this water-soluble B vitamin during pregnancy. Folate deficiency can interfere with the placenta's and the fetus's ability to divide their cells normally, resulting in congenital disabilities. Many pregnancy-related issues, including placenta abruption, spontaneous miscarriage, neural tube deformities, and severe language deficiencies in the progeny, are brought on by folate deficiency. It can be taken through diet; if not, supplements must be taken. The artificial supplement of folate is called FOLIC ACID.

**Risk Factors: [7]**

All pregnant women are at high risk for Anemia as they require more iron and folic acid than usual, but the risk is higher for;

- A woman was bearing more than one child.
- Frequent Vomiting due to morning sickness.
- History of Anemia before pregnancy.
- Heavy Menstrual flow in prepregnancy
- For women with multiple pregnancies (more than one child)

- If having two close pregnancies
- For pregnant teenager
- In pregnant with less intake of diet rich in iron and vitamins
- Noncompliance towards hematinic,
- Low family income
- Administration of a few drugs like antibiotics, NSAIDS, and Antifungal. Etc.
- Various GI pathologies.
- Other social habits like smoking and drinking. Etc.
- Lack of medication adherence.

**Signs and Symptoms: [8]**

Fatigue, weakness, dizziness or lightheadedness, headache, shortness of breath, edema over the body, pallor-conjunctiva, tongue, nails, koilonychia (spoon nails-small nails that look scooped out), glossitis (inflamed tongue), hyperdynamic circulation, swelling over feet or all over the body, tingling, numbness, Pale complexion, Difficulty in concentration, Leg cramps, Cracks in mouth corner, Palpitations, Brittle nails, hair loss, Clumsiness and stiffness in arms legs, Pins and needles sensation in feet, dysphagia (Difficulty in swallowing), lethargy, anorexia, exhaustion, indigestion, irritability, depression, ringing in ears, craving or chewing ice Figure 2.

**Pathophysiology of physiologic Anaemia: [9]**

Anemia during pregnancy occurs due to a Quick increase in plasma blood volume than RBC mass in the body due to the growth and development of the fetus. There is an increased demand for iron and vitamins leads to a decrease in total iron body stores which causes a reduction in hemoglobin levels and serum ferritin levels (28-32weeks).



**Figure 2: Symptoms of Anemia in Pregnancy**

Causes symptoms such as fatigue, dizziness, shortness of breath, pale complexion, concentration difficulty, insomnia, cramps of legs and arms, etc.

**Pathogenesis of Pathologic Anaemia: [10]**

**Iron deficiency anemia:** Hemoglobin is a protein that carries oxygen to various tissues in the body, but during pregnancy, the blood volume will be increased. So, the iron requirement will increase, which causes insufficient total body iron stores and leads to intake symptoms such as fatigue, pale complexion, koilonychia, etc.

**Vitamin b12 deficiency anemia:** Due to the reduced intake of foods such as milk, meat,

& poultry and inability to absorb vitamin b12 in the small intestine due to diseases such as Crohn’s disease, thymidylate, and purine synthesis can be impaired, resulting in impaired DNA synthesis that results in the formation of immature nuclei that appear large & dense and asynchronous cytoplasmic development due to normal RNA synthesis, which leads to megaloblast formation.

**Folate deficiency anemia:**

Many pregnancy-related issues, including placenta abruption, spontaneous miscarriage, neural tube deformities, and severe language deficiencies in the progeny, are brought on by folate deficiency. When methionine synthase is impaired, folate is trapped as methyl tetrahydrofolate, leading to the folate trap phenomenon and increased urine excretion. Folic acid shortage can follow vitamin B-12 deficiency in this way.

**Diagnosis [11]**

**Complete Blood Count:**

It is the most commonly used diagnostic test to determine the number of blood cells in a blood sample.

**The RBC Traits:**

When the cell travels through incredibly tiny blood vessels, it twists and takes on the form of a bell. It doesn’t have a nucleus and is coated by a membrane made of lipids and proteins, and it has hemoglobin inside, a bright red, iron-rich protein that binds oxygen.

This mature RBC has common traits: hematocrit (HCT) and hemoglobin concentration (HGB). Which means corpuscular hemoglobin (MCH), mean corpuscular hemoglobin concentration (MCHC), mean corpuscular volume (MCV), RBC count (RBCC), and red cell distribution width (RDW). These traits are used for diagnosing anemia condition.

**Hematocrit Test:**

The proportion of red cells in your blood measured by volume is called hematocrit. Red blood cells, white blood cells, and platelets are all in plasma and makeup blood. Together, they make up around 45% of the total volume of human blood. However, the exact proportions of each might differ. Age and race have an impact on normal hematocrit levels. Men’s normal levels in adulthood range from 41% to 50%. The typical range for women is significantly smaller, 36%–44%. Anemia is a hematocrit level below the normal range, indicating that the individual has insufficient red blood cells. An elevated hematocrit level or excess red blood cells might point to polycythemia or erythrocytosis.

**Hemoglobin Test:**

The quantity of hemoglobin in your blood is determined via a hemoglobin test. The primary protein in red blood cells is hemoglobin (erythrocytes). Iron is a component of hemoglobin, which enables oxygen binding. Red blood cells’ ability to transport oxygen from your lungs to other bodily tissues and organs is due to hemoglobin Table 1.



**Table 1: Haemoglobin Levels**

Trimester	Haemoglobin Levels	Hematocrit Levels
First Trimester	<11 gm per dl	<33%
Second Trimester	<10.5 gm per dl	<32%
Third Trimester	<11gm per dl	<33%

### Mean Corpuscular Hemoglobin (MCH) and Mean Corpuscular Hemoglobin concentration (MCHC) [12]

The average amount of hemoglobin in a single red blood cell is called Mean Corpuscular Hemoglobin (MCH). MCH typically ranges between 27.5 and 33.2 picograms (pg.). When the MCH value is calculated below 27.5 pg. Then it is called Low MCH. Iron MCH values over 33.2 pg. are regarded as high MCH. An Iron deficiency anemia is frequently seen when the MCH value is low. Anemia brought on by a B vitamin deficit, particularly a lack in B-12 and folate, is frequently the cause of high MCH values. Mean corpuscular hemoglobin concentration is referred to as MCHC. It is a measurement of the typical amount of hemoglobin found within a single red blood cell. By increasing the CBC panel's hemoglobin value by 100 and then dividing by the hematocrit result, the MCHC is determined. Adults should stay under the 33.4-35.5 g/dL reference range for MCHC. Anemia is the most typical cause of low MCHC. Low MCHC is frequently the outcome of hypochromic microcytic anemia. Your red blood cells will be smaller than normal and contain less hemoglobin if you have this disorder. MCH typically ranges between 27.5 and 33.2 picograms (pg.).

### Mean Corpuscular Volume (MCV) and Red Cell Distribution Width (RDW)

Even though IDA is the most frequent reason for a lower MCV, low MCV is insensitive, and up to 40% of pregnant women with real IDA have normocytic indices. The microcytosis of iron shortage is concealed by the stimulation of erythropoiesis during pregnancy. A low MCV is, therefore, not a guarantee of IDA. Low MCV and increased RDW might be sufficient proof to begin iron therapy when a complete biochemical examination of the iron profile is not practical. A subsequent, significant RDW rise that starts soon after the start of treatment might be utilized as a stand-in for IDA confirmation. RDW has been shown to have a sensitivity range of 72–97 % and a specificity range of 82–83% for diagnosing IDA in pregnancy, respectively.

### Newer RBC Parameters

The usefulness and typical reference intervals for the most recent RBC parameter. Modern auto-

mated analyzers can measure advanced red blood cell and reticulocyte indices, including percentage hypochromic reticulocytes (% Hypo), reticulocyte hemoglobin content, and percentage circulating microcyte(%Hypo), which are recognized indications of iron-deficient erythropoiesis. They can be easily used for diagnosing and monitoring therapy in IDA in pregnancy and have also been shown to be early indicators of response to iron therapy than MCV. Validating the use of these markers during pregnancy will require more research.

### Red Blood Cell Count (RBCC)

Hemoglobin, found in red blood cells, carries oxygen throughout the body. The quantity and efficiency of red blood cells determine how much oxygen is transported to the tissues in your body. A blood test called an RBC count specifies the number of red blood cells in your body. A complete blood cell (CBC) count often includes an RBC count. Red blood cell counts are typically lower in women than males and tend to decline with aging. RBC counts often fall in the range of: 4.0 to 5.9 x 10<sup>12</sup>/L for males and 3.8 to 5.2 x 10<sup>12</sup>/L for females. The typical contents are intended as a reference and may change between hospital laboratories. RBC count findings can be used to identify blood-related diseases such as iron deficiency anemia (where there are fewer red blood cells than average). A low RBC count might also indicate a lack of folate, vitamin B6, or vitamin B12.

### Serum Ferritin

The gold standard for diagnosing IDA is bone marrow stainable iron reserves. However, the test is invasive and cannot be used during pregnancy. The best test currently available for confirming iron insufficiency in pregnancy is low serum ferritin levels. Serum ferritin is a more sensitive and focused diagnostic for ID compared to serum iron, transferrin saturation (Tsat), and erythrocyte protoporphyrin levels. Serum ferritin rises early during pregnancy in women with adequate iron reserves before progressively falling to around 50% of prepregnancy levels by 32 weeks (due to hemodilution), then slightly rising in the third trimester. Serum ferritin criteria used to identify pregnancy ID are hotly contested. According to one study, a prepreg-

nancy cutoff of 70 g/dl was predictive of the development of IDA during pregnancy. A cut of 12 g/dl is only 25% sensitive compared to bone marrow iron reserves, but 30 g/dl is 92% specific and 98% specific in identifying ID. Most obstetricians and hematologists advocate a cut of 30 g/dl to locate and treat ID in pregnancy since non-anemic iron deficiency (NAID) is also known to influence the fetomaternal outcome.

Some of the Other Investigations:

- Peripheral smear-Hypochromic, microcytosis, poikilocytosis, anisocytosis
- TIBC (Total Iron Binding Capacity)
- Serum iron and serum ferritin
- Bone marrow examination
- Urine examination
- Stool examination
- Serum protein

### Special Tests

Coombs's test (Look for antibodies that target red blood cells in your blood. It can be used to determine whether you have certain illnesses, including autoimmune hemolytic Anemia.)

RBC folate (RBC is frequently requested with Vitamin B12 to help diagnose megaloblastic and macrocytic Anemia.)

OFT (osmotic fragility test)

NESTROF test (Naked eye single tube red cell osmotic fragility test) is a simple and cost-effective screening test to detect Beta-thalassemia. This inherited blood disorder causes your body to have less hemoglobin in pregnant women.

HB electrophoresis (checks the Abnormal type of hemoglobin)

### Complications

**Pre-eclampsia**-Micronutrient and antioxidant deficiencies could cause preeclampsia in women with severe Anemia. According to recent research, preeclampsia may occur due to decreased serum calcium, magnesium, and zinc levels during pregnancy.

### Abruptio Placenta

Due to inadequate oxygenation of the placental tissue, Anemia may be a direct cause of the worsening of embryonic growth, leading to placental abruption.

**Preterm Labor**-Anemia can cause maternal and fetal stress by producing hypoxia. At the same time, iron deficiency can do the same by raising serum norepinephrine levels and increasing the production of corticotropin-releasing hormone (CRH). One of the main risk factors for preterm labor is elevated CRH concentrations.

**Lower birth weight** of baby due to preterm labor.

### Puerperal Sepsis

A genital tract infection occurs during labor or within 42 days of postpartum. Mothers who are anemic do not naturally resist infection due to low blood count after delivery and increase the risk for diseases, which might result in puerperal sepsis.

**Sub involution of uterus** condition when the average postpartum return of the reproductive organs to their prepregnancy state that is slowed down or prevented due to pelvic infections, retention of placental fragments, or any other factors that interfere with myometrium contractions and cause irregular uterine bleeding, backaches, or a feeling of weight in the pelvis.

### Lactation Failure:

It occurs due to maternal blood loss and iron depletion during childbirth.

### Increased risk of PPH (postpartum hemorrhage):

Over one-third of all pregnant women are anemic, dramatically raising the PPH risk. Anemia women cannot withstand the same amount of blood loss as healthy women because Anemia lowers the blood's ability to carry oxygen. Yet the same blood loss threshold defines PPH in all women.

### Amniotic fluid complication:

Such as oligohydramnios (low level of amniotic fluid) and polyhydramnios (excessive amniotic fluid) etc.,

**Maternal mortality** due to sepsis, thromboembolism, cerebral anoxia

### Neural tube abnormalities in the fetus:

A fetus with congenital abnormalities and malformations may occur due to a folate shortage (folate and vitamin B12 insufficiency) by interrupting DNA biosynthesis or methylation reactions, preventing the appropriate neural tube closure.

**Cardiac failure and shock**-Anemia cause cardiac stress due to tachycardia, an increase in stroke volume, and because it may result in fluid retention and decreased renal blood flow, further strains the heart. Hemorrhaging or a septic infection are frequent causes of maternal shock.

**Preventive Measures [13]**

We should make sure to get enough iron through diet during pregnancy. At least aim for three servings a day of nutritious food in the diet of pregnant women such as;

**Iron Rich Food Includes:**

- Green leafy vegetables (spinach, broccoli, kale, Sowa, chana sag, Salgametc)
- cereals such as wheat, ragi, jowar, bajra
- beans (dry beans, kidney beans) and tofu
- Jaggery, Beetroots, and legumes
- Pulses (sprouts, lentils, peas such as green peas, chickpeas, and cow peas)
- nuts and seeds-pumpkin seeds, cashews, pine nuts, and sunflower seeds
- eggs, chicken, fish, red meat (beef, pork, goat)
- Fruits such as Dates, apples, bananas and melons.

**Vitamin C Rich Food:** Help To Absorb More Iron It Includes. Strawberries, Citrus fruits, juices, Guava, Kiwis, Tomatoes, Bell pepper, Pomelo, Amla, Kale, lemon.

**Folate Rich Food Includes [14]**

Help to prevent folate deficiency includes Avocado, Asparagus, Broccoli, Okra, papaya, black-eyed peas, cantaloupe, etc.,

Routine iron supplementation is advised by most experts throughout pregnancy in two ways: daily or intermittent iron intake, as the increased demand for iron is frequently not supplied by a regular diet. Regional recommendations for iron supplementation differ, but the CDC advises all pregnant women to take a 30 mg iron supplement daily at their first prenatal appointment. For all pregnant women, the WHO recommends 30–60 mg of elemental iron daily to improve maternal and newborn outcomes. The WHO also suggests intermittent oral iron and folic acid supplementation with 120 mg of essential iron and 2.8 mg of folic acid once weekly for pregnant women. In a recent Cochrane review, researchers found that women receiving intermittent iron (80–300 mg of elemental iron per week) had a lower risk of side effects and a similar risk of preterm delivery, low birth weight, and Anemia at term, as well as a lower risk of having high Hb concentrations at period. An intermittent regimen is advised

when daily iron is intolerable owing to gastrointestinal adverse effects. Before beginning the intermittent regimen, precise maternal hemoglobin values are necessary. If Anemia is found, a woman should take 120 mg of elemental iron and 0.4 mg of folate daily until the Anemia is treated. After then, she can continue with a regular or intermittent daily routine, depending on her tolerance.

**Pharmacological Treatment [15]**

Iron supplementation can be given in the oral or parenteral form.

**Oral Iron Therapy**

It involves different iron molecules and is a safe, inexpensive, and effective way to administer iron.

**Ferrous sulfate**

It is available in the name of Feosol, Feratab, and Slow Fe with a dose of 50mg, and it may have the adverse effects of nausea, constipation, stomach pain, diarrhea, and loss of appetite.

**Ferrous fumarate**

It is available in the name of Hemocyte, Femiron, Ferrets iron, Livogen-Z, and Zincofer with a dose of 325mg.

It may have the adverse effects of abdominal pain, severe stomach pain, etc.

**Ferrous gluconate**

It is available in the name of Ferate, Fergon, and Ferracet with a dose of 325mg, and it may have the adverse effects of green-colored stools, constipation, and diarrhea.

**Ferrous calcium citrate**

It is available in the names of Raricap, Raricap forte, and Rerifer with the dose of 25 to 50 mg and may the adverse effects such as bloating, dry mouth, nausea, and diarrhea.

**Ferric maltol**

It is available in the form of Accrufer and Ferrcru with a dose of 30mg and may have the adverse effects of tiredness, weakness, shortness of breath, muscle pain

**Folic acid**

It is available in the form of Folrite and Folacin with a dose of 2 to 5 mg and may have the adverse effects of rough itching, swelling, and trouble breathing.

**Iron, zinc, and vitamins**

It is available in the form of Amchelate, which consists of iron 30mg, zinc 10mg, folic acid 1.5mg, and vitaminB12 15mcg

**Table 2: Brandname, doses, and uses of drugs**

S.No.	Drug	Brand Name	Doses	Uses
1.	Ferrous Sulphate	Feosol, Per-In-Sol, Fer-Gen-Sol, Feratab	50mg	Iron Deficiency Anaemia
2.	Ferrous Fumarate	Hemocyte, Ferriton, Ferrels Iron, Livogen-Z, Zincofer.	325mg	Iron Deficiency Anaemia
3.	Ferrous Gluconate	Ferale, Fergon, Ferracet	325 Mg	Iron Deficiency Anaemia
4.	Ferrous Calcium Citrate	Raricap, Raricap Forte, Rerifer.	25-50mg	Iron Deficiency Anaemia
5.	Ferric Maltol	Accrufer, Ferrcurr	30mg	Iron Deficiency Anaemia
6.	Folic Acid	Folrite, Folacin	2-5mg	Iron Deficiency Anaemia, B12, Folate Deficiency
7.	Iron, Zinc, Vitamins	Amchelate	Iron-30mg, Zinc-10mg, Folic Acid-1.5mg, Vit.B12-15mcg	Iron Deficiency Anaemia, B12, Folate Deficiency
8.	Ferrous Ascorbate And Folic Acid	Hemfer-Xt, Fur-Xt	Ferrous Ascorbate -100mg Folic Acid-15mg	Iron Deficiency Anaemia, Folate Deficiency
9.	Ferrous Bisglycinate And Zinc Glycinate	Glyzifer	Ferrous Bisglycinate -35mgzinc Glycinate-12mg	Iron Deficiency Anaemia
10.	Oral Cyanocobalamin	Farfolxt, Cyanoco B12	50-150µg	B12

**Table 3: Brandname, doses, and uses of drugs**

S.No	Drug	Brand Names	Doses	Uses
1.	Iron Dextran	Dexferrum	25-100mg	Iron Deficiency Anaemia
2.	Iron Sucrose	Venofer	100-200mg	Iron Deficiency Anaemia
3.	Ferrous Gluconate	Discover	22.2mg	Iron Deficiency Anaemia
4.	Sodium Ferric Gluconate	Ferrlecit	62.5mg	Iron Deficiency Anaemia
5.	Ferric carboxymaltose	Ferringet	50mg	Iron Deficiency Anaemia
6.	Newer Iron Isomaltoside	Isofer, Jilazo	100mg	Iron Deficiency Anaemia
7.	Ferumoxytol	Feraheme	510mg	Iron Deficiency Anaemia
8.	Hydroxocobalamin	Hydroxo B12, Neo-B12	1mg	B12
9.	Cyanocobalamin (IM/SC0)	Vi- B12	1000mcg	B12

**Ferrous Ascorbate and Folic acid**

It is available in the form of HEMFER-XT and FUR-XT **Ferrous bis-glycinate and zinc glycinate**-It is available in Glyzifer, consisting of 35mg of ferrous bis-glycinate and 12mg of zinc glycinate used to increase the hemoglobin levels in pregnant womenTable 2.

**Parenteral Iron Therapy**

**Iron dextran:**

It is available in the Dexferrum in the 25 to 100mg dose to treat poor iron conditions who cannot take it by mouth. It is a form of mineral iron essential for many bodily functions, and it may have adverse effects such as arthralgia, hypersensitivity reactions, backache, and myalgia.

Some of the other parenteral forms are Ferric carboxyl maltose 50mg/ml, Iron sucrose (Imax 100mg/5mL)(orofer50mg/2.5mL)Table 3.



Complications may include local thrombophlebitis at the IV site, fever, systemic malaise, urticaria, and lymphadenopathy.

In severe anemia conditions, blood transfusion is the other process done when there is a failure of response to iron therapy, severe bleeding, rupture of the uterus, etc.

## CONCLUSION

Anemia is the most often seen disorder during pregnancy or the gestational period. Prevalence of pregnancy-related Anemia ranges from 65% to 75% in India, 51% in underdeveloped nations, and 14% in wealthy countries. The form of Anemia that is most frequently seen in pregnant women is iron deficiency anemia. Anemia brought on by pregnancy is primarily due to increased blood volume. As a result, it is called physiological Anemia. Anemia is more common in pregnant women as their gestational age or trimester grows (third trimester > the second trimester > first trimester). Anemia risk has increased, which has impacted QOL due to symptoms occurring more frequently and linked to difficulties in the mother and fetus. Iron treatment or hematinic is essential for the mother's and the fetus's health to be safeguarded and protected. Preventing Anemia in pregnant women is a crucial undertaking since it significantly influences both the mother's and the fetus's health. Pregnancy problems, including improper neural development, heart failure, and premature labor, are all caused by severe Anemia. Using iron supplements (ferrous sulfate, cyanocobalamin, folic acid, etc.) as a preventative measure is the best way to lower the chance of developing Anemia. Red meat, green leafy vegetables, paneer, and other foods are essential in avoiding Anemia during pregnancy. Lack of medication adherence by the patient is the most often noted risk factor for anemia advancement, even after a precise diagnosis.

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## Conflict of Interest

The authors declare that this study has no conflict of interest.

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