

## Anemia With Prgnancy

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### **Abstract:**

Anemia is the commonest medical disorder in pregnancy and severe anemia is associated with poor maternal and perinatal outcomes. It is one of the most important health problems among women from 18 to 45 years of age in the world. Anemia in pregnancy is considered as one of the major risk factors for contributing 20-40% of maternal deaths directly or indirectly through cardiac failure, preeclampsia, antepartum hemorrhage, postpartum hemorrhage, and puerperal sepsis. As well as to low birth weight which in turn might contribute to an increased percentage for infant mortality in developing countries. The prevalence of anemia in pregnancy varies considerably because of differences in socioeconomic conditions, lifestyles, and health-seeking behaviors across different cultures. Women of low socioeconomic groups and teenagers are more susceptible to anemia during pregnancy. More commonly, anemia in pregnancy is due to lack of iron and less often, it is caused by folic acid deficiency. Iron and folate supplementation is indicated during pregnancy to prevent complications. In a normal pregnancy, the hemoglobin concentration becomes diluted according to the increase in the volume of circulating blood. Anemia is diagnosed by estimating the hemoglobin concentration and examining a peripheral blood smear for the characteristic red blood cell changes

**Keywords:** Anemia, Pregnancy, Iron, Hemoglobin (Hb)

### **Introduction**

ANEMIA is a common problem around the world during pregnancy. It affects more than 56% of women living in developing countries and about 41% of pregnant women worldwide. The Centers for Disease Control and Prevention define anemia as hemoglobin <11g/dl, in first and last trimesters, or <10.5g/dl in the second trimester. There is a rise of iron and foliate needs in pregnant women, therefore the possibility of suffering from Iron and foliate deficiency is increased if there is no supply during the pregnancy. Malnutrition, low socio economic and multipara are important risk factors for anemia and its complications. The main causes of anemia during pregnancy are iron deficiency and folic acid deficiency but others causes like

hemoglobinopathies, bleeding during pregnancy and infections may

Be found (1.2.3.4)

### **Prevalence**

During pregnancy, anemia affects more than 1.5 billion people worldwide according to world health organization (WHO) surveys. The prevalence is more common in Africa, Asia, India and some areas in Europe. Anemia has been found more in 3 groups: younger children (50%), pregnant women (45%), and women in the childbearing period (30%). More than about third of pregnant women in Arabic countries have anemia, in Egypt 30% have anemia, 31% in Iraq, Morocco 32% Qatar 28 %, Saudi Arabia 40%, Tunisia 29%, and United Arab Emirates 26%.(5.6.7)

### Classification and Causes of anemia during pregnancy

Anemia during pregnancy may be classified into two main types (8.9.10.11.12):

#### (A) Physiological anemia.

#### (B) Pathological anemia.

**(A) Physiological Type:** there is an unequal increase in plasma volume up to 50%, RBC 30% and Hb 20% mass in pregnancy. An increase in both red cell mass and plasma volume occurs to meet the needs of the fetus in pregnant women. During pregnancy, the plasma volume increases to reach a plateau in the 8<sup>th</sup> and 9<sup>th</sup> month of pregnancy, then decreases rapidly after delivery and reaches the non-pregnant level about 3 weeks postpartum. The rise is about 1000 ml, which equates to about 50% of the circulating plasma volume in non-pregnant women. But, the rise in plasma volume is more than the red cell mass leading to a decrease in the hemoglobin concentration in the blood despite the increase in the total number of red cells and this decreases the blood resistance to flow and this may enhance the placental blood flow leading to a better supply of fetal requirements. So this fall in hemoglobin concentration may improve fetal outcome. Also extra iron during pregnancy is required especially in the second and third trimester. So, pregnant women may have anemia due to hem dilution & increased iron needs. it is diagnosed by - Hb% 10 gm/dl - Red blood cells count(RBCs) 3.5 million/mm<sup>3</sup> - Hematocrit 30%, -RBCs show normal morphology with central pallor in the peripheral blood film.

#### (B) Pathological Type: Include

- 1- Deficiency anemia (Iron deficiency anemia, folate and vitamin B12 deficiency anemia).
- 2- Hemorrhagic anemia due to any cause of bleeding during pregnancy.
- 3-Hemolytic anemia either acquired or hereditary (Hemoglobinopathies).

4-Anemia of infection: as by malaria or tuberculosis.

5-Anemia of chronic disease as neoplastic disorders or renal disorders.

**Iron Deficiency Anemia:** is a common public health problem in pregnant women in developing countries, occurring in two-thirds of pregnant women and leading to maternal adverse effects (13, 14).

It is more common in multipara, low socio-economical and educational statuses women with increased prevalence in developing countries, and affects about 30 – 50% of the pregnant women. Iron deficiency anemia is considered as the major cause of anemia in pregnancy (15, 16).

**Megaloblastic anemia:** is the second most common cause of nutritional anemia during pregnancy and includes folate and vitamin B 12 deficiency. Folate deficiency is more common than vitamin B 12 deficiency due to excess stores of vitamin B 12 in the body. Megaloblastic anemia may occur due to increased demand for folic acid and pernicious anemia. Both folic acid and vitamin B12 are essential for neurodevelopment of fetus and their deficiency lead neurotubal defects and nervous system damage.

**Hemoglobinopathies:** Is inherited genetic disorders affected hemoglobin synthesis or structure the most common are Beta-thalassemia (abnormal hemoglobin synthesis) and sickle cell diseases (abnormal hemoglobin structure).

They are more common in the Mediterranean region; some areas in Africa and Asia cause chronic hemolytic anemia. Sickle cell diseases increase risk of infections and thrombosis in sickle cell crises. Genetic screening and diagnosis of parents are required before planning for pregnancy.

**Hemorrhagic anemia:** occurs due to causes of bleeding during pregnancy like abortion, ectopic pregnancy, and antepartum hemorrhage

**Effects of Anemia on Pregnancy:**

**Maternal effects:**

Anemia during pregnancy leads to multiple maternal adverse effects. The decrease in maternal hemoglobin less than 11.0 g/dl is associated with a significant increase in the maternal mortality rate. The maternal mortality rate increases threefold when maternal hemoglobin levels decrease less than 8.0 g/dl and about tenfold increase when maternal hemoglobin levels decrease less than 5.0 g/dl. (17, 18)

During pregnancy, mild anemia may not affect pregnant women except if there is a decrease in iron stores and may become severely anemic in the next pregnancies. Easy fatigability and poor work performance, palpitations, breathlessness, increased cardiac output may lead to de-compensation and cardiac failure which may be lethal. Also, Increased risk of pre-term delivery (28.2%), pre-eclampsia (31.2%) and sepsis have been occurred in severe anemia (19,20)

**Fetal effects**

During the pregnancy, the fetus is still taking its needs of iron from maternal transferrin. But may suffer from fall in iron stores due to low maternal stores and increased incidence of pre-term, low birth weight, intrauterine growth restriction and perinatal mortality rate in anemic women (21,22).

**Clinical Signs and Symptoms:**

Pregnant women may be asymptomatic and anemia can be diagnosed following routine investigations. Nonspecific signs and symptoms may present with fatigue being the most common. Also, women may suffer from headaches, palpitations, dizziness, and dyspnea and hair loss.

**Diagnosis**

- Good history taking of obstetrics and gynecological conditions and social habits may be useful in the diagnosis of some causes like iron deficiency anemia and hemorrhagic anemia.

Physical examination may show pallor, bounding pulse, and systolic flow murmur (hemic murmur) and may detect cause as in antepartum bleeding.

**Investigations**

- Hemoglobin level: the different hemoglobin cut off levels are essential for diagnosis and important to differentiate between hydremia and true anemia during pregnancy. Hemoglobin is not less than 11.0 g/dL in the first and third trimester and 10.5 g/dL in the second trimester. So hemoglobin level less than 10.5 g/dL should be considered as anemia and should be investigated.
- Oral iron trial therapy may be diagnostic or therapeutic. Iron therapy should show an increase in Hb within three weeks. An increase in hemoglobin concentration in pregnant women confirms the diagnosis of iron deficiency anemia. But with no increased level, further tests must be done.
- Serum ferritin early treatment should be started when Ferritin levels become less than 30  $\mu$ /l which means low iron stores. Iron deficiency anemia is conformed when levels become less than 15 $\mu$ /l.
- Mean corpuscular volume decrease in thalassemia and iron deficiency anemia but increase in megaloblastic anemia and normal in hemorrhagic anemia.
- Transferrin level and total iron-binding capacity are increase in iron

- deficiency anemia but normal in thalassemia.
- Transferrin saturation is decreased in iron deficiency anemia but may be normal or increased in thalassemia.
  - Measurement serum iron and folate and vitamin B12: iron level decrease in iron deficiency anemia, serum folate and vitamin B12 decrease in megaloblastic anemia.
  - Hemoglobin electrophoresis for diagnosis thalassemia and sickle cell diseases.
  - Ultrasonography for renal and hepatic disorders.

### Management

- The pregnant women must be routinely investigated for anemia at booking and at 28 weeks gestation.
- Iron deficiency anemia treatment: During pregnancy, women should be advised regarding diet with information about foods rich in iron, along with factors that may increase or decrease the absorption of iron. This should be done with a written form. Iron supplementation must be considered if dietary changes are not enough for treating iron deficiency
- Iron supplementation may be in form oral, parental (intramuscular or intravenous) iron therapy and must persist for 3 months after correction anemia to replenish iron stores
- Daily elemental iron 100-200 mg is required for treatment anemic women
- Intravenous iron is used in cases of noncompliance or intolerance to oral iron therapy, malabsorption syndrome or rapid restoration of hemoglobin and iron stores are needed
- Treatment of megaloblastic anemia: foliate deficiency is treated by 5 mg of folic acid through pregnancy and vitamin B12 deficiency is treated by

intramuscular cobalamin 1000mcg daily for 1 week followed by monthly cobalamin1000mcg injections

- Treatment of hemoglobinopathies: are treated by blood transfusion but chelation therapy may be used in thalassemia. Symptomatic treatment of painful crises in sickle cell diseases is required .treatment should be done in collaboration with hematologist.
- A blood transfusion may be also needed in cases of hemorrhagic anemia with continues bleeding, risk of cardiac compromise or severe anemia need urgent correction.
- Prophylactic measures must be used to decrease blood loss during delivery in the form of blood transfusion and ecboic to enhance uterine contractions (20.23.24).

### Prophylaxis

All pregnant women should take a standard dose of 60mg Iron +400µg folic acid daily for 6 months. Also, iron supplements contain 300-500 µg is good for prophylaxis. Eating more green vegetables and meat are required during pregnancy.

Food enhancement with folic acid is recommended and is already in use in developed countries (25.26.27).

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