Obstetrics & Gynecology

Doctor 2019 - نبض - Medicine - MU

Anemia in Pregnancy

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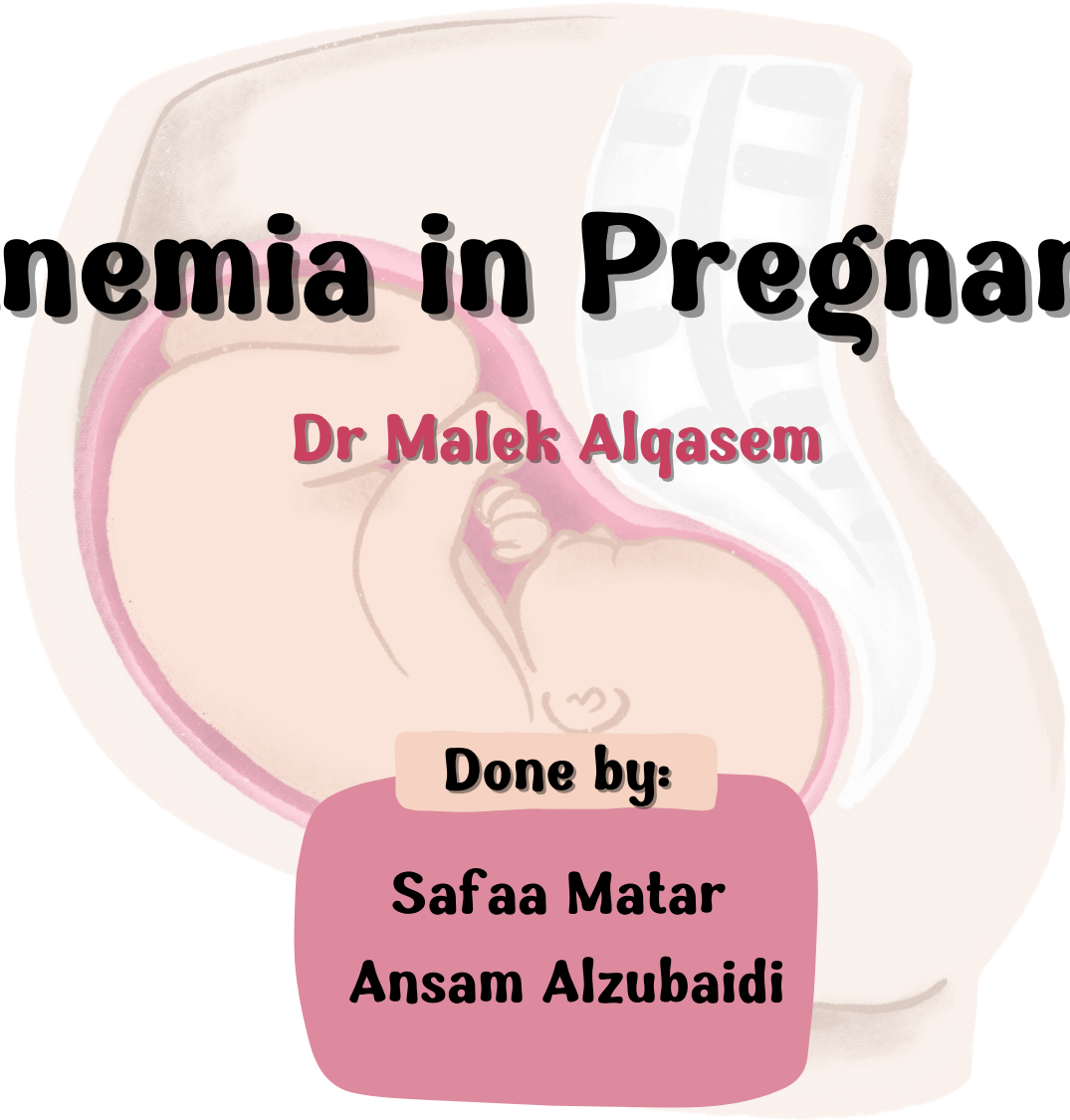

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This sheet contains:

- lecture slides
- Doctors notes
- additional notes and pictures from OBS & GYN books

Introduction

Anemia is common in pregnancy (from 5.4% in developed countries to more than 80% in developing countries)
Anemia in pregnancy has been associated with maternal and fetal adverse outcomes
-Hb used to define anemia in pregnancy is lower than in non-pregnant patients
An increased requirement of iron in pregnancy so iron deficiency remains the most common cause of anemia in pregnancy and warrants a preemptive approach to prevent a further reduction in Hb
Anemia secondary to sickle cell disease and autoimmune hemolytic anemia merit special attention because there are risks secondary to red blood cell transfusion and risks to withholding transfusion
we should screen for anemia to avoid its complications to the baby & mother

Normal physiological changes in pregnancy

Alterations of hematological parameters particularly in a reduction of hemoglobin (Hb) concentration:
-Total blood volume increases by 50%
Plasma volume rises from 6 weeks gestation progressively increasing to a peak at 32 weeks gestation (due to hormone-mediated vasodilation subsequent activation of the renin-angiotensin-aldosterone system)

During pregnancy (Physiological anemia) :

Angiotensinogen rises with estrogen production
Increased vasopressin leads to salt and water retention
RBC mass increases from the early 2nd trimester around 30-35% a lesser degree compared with plasma volume
The increase in RBC mass results from an increased erythropoietin level in response to circulating progesterone and placental lactogen
The disproportionate increase in plasma volume to RBC mass leads to decreased Hb and hematocrit levels

Definition of anemia in pregnancy by WHO

Anemia in pregnancy is defined as Hb:

11>g/dl in the 1st trimester
10.5> in the 2nd & 3rd trimester
10> in the postpartum period

General approach :

Preconceptional monitoring of Hb
Treatment of low Hb
Keep in mind that the most common cause is IDA
The goal is To avoid post-partum complications

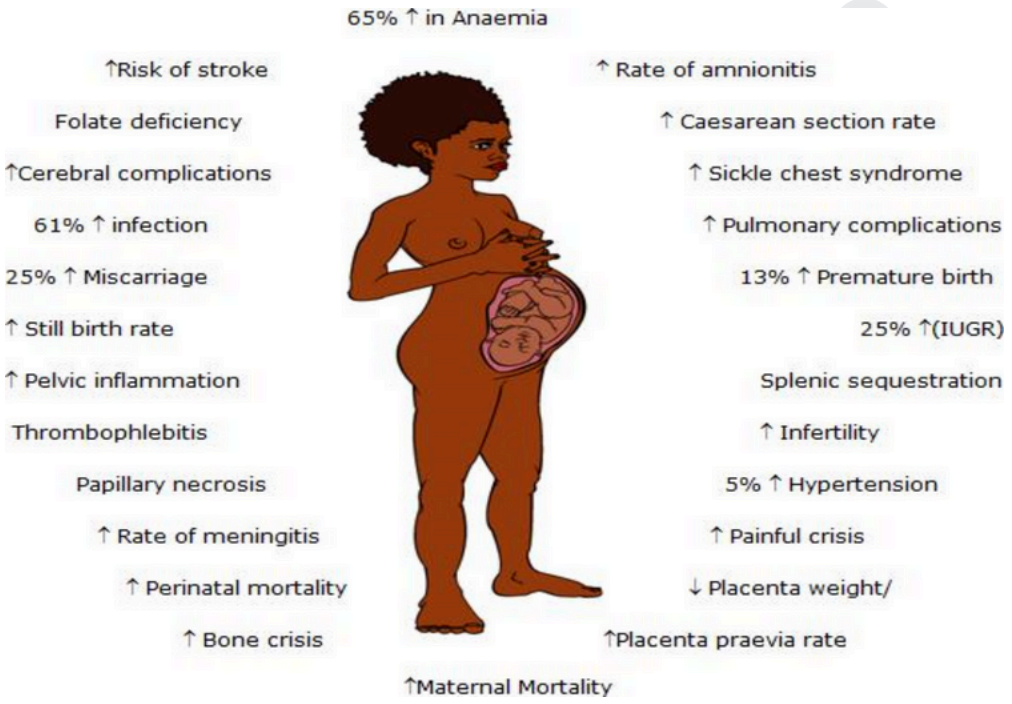
Choice of contraception :

Copper-IUD is not good for IDA due to menorrhagia
Sick cell crisis: Progesterone-containing methods are better

Types :

Microcytic anemia → Iron or Thalassemia
Megaloblastic anemia → B12 or Folate deficiency
Hemoglobinopathy → Sickle cell anemia

Complications of anemia in pregnancy



Thalassemia

Adult Hb consists predominantly of HbA composed of α and β globin.
Adult Hb also consists of a small proportion of HbA2 (α2δ2) and HbF (α2γ2)
Thalassemia refers to the reduced production of α and/or β globin chains due to mutations in the α and/or β globin gene

Worldwide commonest inherited single-gene disorders

Absent or decreased normal α and B globulin chains
Autosomal recessive condition
-Heterozygous called trait
-Homozygous called disease
Women with trait status don't need special care
Women with HbH may have a successful pregnancy
Close medical evaluation and follow-up
Increased risk of neural tube defect due to folic acid deficiency

The laboratory parameters suggestive of thalassemia consist of :

Microcytic, hypochromic anemia.

Management and counseling:

All women should be offered hemoglobinopathy screening To :
Identify early those at risk of the affected baby
Offer prenatal diagnosis
To prevent infant morbidity and mortality
Counsel :
Maternal and fetal risk
If the fetus is affected involve pediatricians
Folic acid 5 mg before and during pregnancy
No specific intrapartum or postpartum care

Beta thalassemia:

Effects of pregnancy on B thalassemia:

Trait → Mild anemia
Major → Risk of blood transfusion increases
Maternal complications of iron overload:
→ If short stature with pelvic bone deformity
CPD → risk of CS increasing

Effects of B thalassemia on pregnancy:

Beta Trait has a normal outcome
Beta Major
Fetal hypoxia due to maternal anemia
IUGR
Preterm birth

Alpha Thalassemia:

Alpha major is incompatible with life

HbH disease:

Mild to moderate hemolytic anemia

Adult: worsened in pregnancy

Hepatosplenomegaly

Effects of pregnancy on alpha thalassemia:

Alpha trait has Normal outcome

Alpha major Maternal risks:

Gestational hypertension (50%)

Preeclampsia (30%)

Placental abruption

Obstructed labor (large baby)

DIC APH PPH

Effects of alpha thalassemia on pregnancy:

Alpha trait has normal outcome

Alpha major:

Incompatible with life baby

Severe anemia

Hydrops fetalis

Abnormal organogenesis

Polyhydramnios

Placentomegaly

Stillbirth

Iron deficiency anemia (IDA)

The most common type of anemia during pregnancy (75% of cases).

Is caused by blood loss, insufficient dietary intake, or poor absorption of iron from food

Diagnosis: if microcytic do an iron study

Ferritin level has the greatest sensitivity and specificity

Signs & symptoms :

-Irritability
-Angina (chest pain)
-Palpitations (feeling that the heart is skipping beats or fluttering)
-Breathlessness
-Tingling, numbness, or burning sensations
-Glossitis (inflammation or infection of the tongue)
-Angular cheilitis (inflammatory lesions at the mouth's corners)
-Koilonychias (spoon-shaped nails) or brittle nails
-Poor appetite
-Dysphagia (difficulty swallowing) due to the formation of esophageal webs (Plummer (Vinson syndrome
-Restless leg syndrome

Parameters:

↓ Ferritin Hemoglobin MCV MCH

↑ Total iron-binding capacity Transferrin RDW

OB Triad

Iron Deficiency Anemia

- Hemoglobin <10 g
- MCV <80 μm^3
- RDW >15%

IRON

- Iron requirements ↑ in pregnancy to about 1000 mg/day.
- Most of the iron is used for hematopoiesis, especially in the last half of pregnancy.
- The amount of iron from the diet is insufficient to meet the needs of the pregnancy, so many patients will need to take supplemental iron. The most common side effect of this supplementation is constipation.

Management:

RCOG guidelines recommendations :

Iron supplement for all women after 12 weeks if there are no contraindications

Daily elemental iron 30 mg prophylaxis

60-120mg treatment

Dosage forms :

Ferrous sulfate 325 mg (65 mg iron)

Ferrous gluconate 300 mg (34 mg iron)

Ferrous fumarate is a large compound compared to ferrous sulfate 300 mg (98.6 mg iron)

Foods rich in ascorbic acid (vitamin C) enhance iron absorption

If the patient is taking a Calcium supplement, Iron should not be taken at the same time should be 12 hours apart ;(Calcium in the morning & Iron in the evening and so on)

Indications for IV iron therapy:

-Can't take Iron by mouth

Can't absorb Iron adequately through the gut- have inflammatory bowel disease or other intestinal illnesses that are aggravated by oral iron supplements

-Can't absorb enough iron due to blood loss

-Need to increase iron levels fast to avoid medical complications or a blood transfusion

All types of treatment can increase Hb by 0.8 g/dl/week

IV iron has minimal side effects but should be monitored for :

Gastrointestinal pain such as nausea and cramping

Difficulty breathing

Skin irritations/rash

Chest pain

Low blood pressure

Anaphylaxis can include difficulty breathing, itching, and rash

Precautions before giving IV iron :

Prepare IV Hydrocortisone + Anti-histamine

Dilute Iron in 250-500 ml of N/S given over 2 hours

IM route should be avoided as it leads to :

Pain

Abscess formation

Megaloblastic anemia

Impaired DNA synthesis → Ineffective erythropoiesis.
Folic acid deficiency 2nd most common during pregnancy
Less common B12 deficiency which is difficult to detect (folic acid supplements masking B12 (deficiency
Slowly progressive
Tend to occur mostly in 3rd trimester

Usual symptoms :

Weight loss Anorexia Glossitis Bleeding due to thrombocytopenia

Leads to poor outcomes :

Placenta abruption Preeclampsia IUGR PTL
Folic acid deficiency may lead to open neural tube defects

Labs:

Macrocytic normochromic anemia
-Peripheral blood smear hypersegmented neutrophils & oval macrocytes and Howell Jolly bodies
Erythrocyte folate level is the best indicator of the serum level

Management :

Folate deficiency: treated with folic acid 1 mg/day within 10 days WBC and Platelet normalize, Hb increases after several weeks
B12 deficiency: IM cobalamin 1 mg monthly or sublingual

OB Triad

Folate Deficiency Anemia

- Hemoglobin <10 g
- MCV >100 μm^3
- RDW $>15\%$

Sickle cell anemia

Autosomal recessive.
Sickle-shaped RBCs
Common in African Americans (8%), Middle East & India
Hb S: Sickle cell anemia
Hb SC: Sickle cell hemoglobin C
Hb S -Thal: Sickle cell -Thalassemia
Hb SS: Homozygosis is the most common phenotype (Saudi Arabia), Less soluble, and tends to polymerize and distort RBCs

Risk of sickling increased during pregnancy (metabolic requirements)
Risk of vascular stasis + Hypercoagulable status

Pathogenesis :

Hemolytic anemia → Extravascular hemolysis → Chronic anemia → Microvascular obstruction → ischemia → Infraction(Vaso-occlusive crisis)

Points:

Pregnant with sickle cell trait have twice the frequency of UTIs
SCA patients should be screened for UTIs each trimester
Blood pressure checked every visit
One in four children will be affected if parents have SC trait
Clear care for those women

Complications :

Spontaneous miscarriage IUGR IUFD SGA Preeclampsia Preterm labor
UTI more than 2 time

Labs:

Normocytic normochromic anemia
Reticulocyte count (3-15 %) ↑
LDH ↑
Haptoglobin ↓
Peripheral blood: sickle cell, target cell, Howell-Jolly bodies
<u>Screening and diagnosis by Hb electrophoresis :</u>
Hb S (85-100%)
Absent Hb A
Normal Hb A2
Hb F elevated more than 15%

Management (OSCE):

Hydroxyurea is not recommended in pregnancy (should be stopped 3 months before (pregnancy
BP & Urinalysis (UTI & Proteinuria) for each visit
Infections should be treated with antibiotics
Severe anemia needs blood transfusion (in more severe plasma exchange)
Pain crises are managed with O2, hydration (vomiting and nausea are common), analgesia
Should receive pneumococcal vaccine before Pregnancy
Folate supplements 4 mg/day
Low-dose Aspirin as prophylaxis for PET
Give Iron supplements only by indication
Fetal well-being twice weekly since 32 weeks
Low-molecular-weight heparin any antenatal hospital period if there are no contraindications
Fetal growth weekly in 3rd trimester
Avoid dehydration and stress during the intrapartum period
Avoid pethidine as it increases the risk of seizures
Early ambulation after delivery or wearing stockings to prevent thromboembolism

Contraception :

Excellent options are Mirena and Progesterone only pills
COC are contraindicated
Medroxyprogesterone acetate decreases pain crises

Blood transfusion in sickling patients:

May precipitate a crisis if a sudden increase in HCT
Hb 6-8 g/dl is typical for HbSS
Consider transfusion if :
Severe anemia Multiple pregnancy Preeclampsia
Acute chest syndrome Acute renal failure
Target level < 30 % of sickle cells in circulation :
Partial exchange transfusion
Time and mode of delivery
SCD with normal growing fetus :
Prepare cross-matched blood before delivery
the hematologist should be consulted
Induction of labor or CS (by indication as SCD is not an indication for CS) at 38 weeks
Epidural analgesia is preferred
Continuous intrapartum fetal monitoring

Key points

Offer screening for anemia at booking and 28 weeks as this allows time for treatment.

Hb < 11 or 10.5 in 2nd trimester need investigation

Anemia increases the risk for Preterm labor

The parenteral iron should only be considered for intolerant women

At term, IDA should be treated with blood transfusion