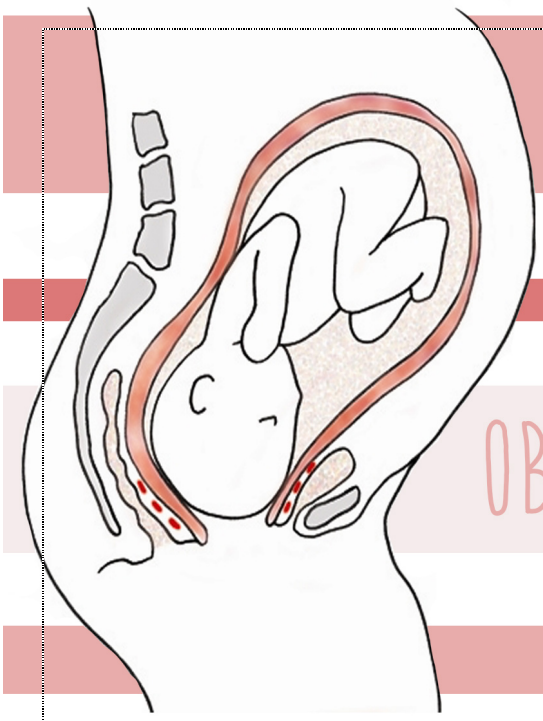

OBSTETRICS AND GYNECOLOGY

(Tutorial 4) Anaemia in Pregnancy

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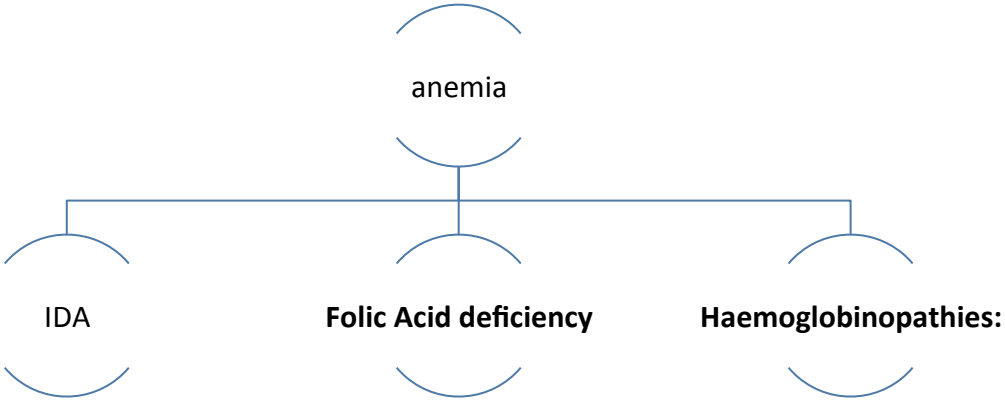
Doctor's note Team's note Not important Important

Objectives:

Not given☹



Anaemia in pregnancy

Anaemia is one of the most common disorders affecting humans in the world.

The WHO defines anaemia as Haemoglobin (Hb) < 11g/dl.

Hb 10 in pregnancy is accepted

Chronic anaemia results in the sense of well-being; fatigue, stress, decrease in work capacity. Symptoms depend on the degree of anemia.

Anaemia in pregnancy is associated with an increased risk of maternal and fetal morbidity & mortality.

Physiological changes in pregnancy

- ✓ Healthy pregnancy and puerperium are associated with marked physiological changes in the circulating blood; increase in blood volume and alteration in the factors involved in haemostasis.
- ✓ These changes have relevance to the most potential and hazardous haematological problems of pregnancy& delivery.

Physiological changes:

↑ Blood volume

↑ Plasma volume by 50%

↑ Red blood mass by 25%

Plasma volume is more than RBC so hemo-dilutional effect

Hypervolemia state modifies the response to hypotension in the first half of pregnancy and the blood loss at delivery.

- ✓ Vaginal delivery; More than 500 ml blood loss = post partum hemorrhage.
- ✓ Caesarean section? More than 1000 ml blood loss = post partum hemorrhage.

* Prophylactic Iron supplement should be given to all pregnant women because of increase in demand in both mother and growing fetus.

Causes:

- Inadequate intake of nutrition (even if the pregnant lady is eating well she might have bad habits like drinking tea after meals which interferes with the absorption of the Iron).
- Excess blood loss (mainly because irregularity of menstrual cycle before pregnancy e.g. menorrhagia).
- Abnormal demand.
- Malabsorption.

Anemia depends on the gestational age, a pregnant lady is called anemic if:

- 1st trimester HB <11
- 2nd + 3rd trimester HB < 10.5
- Post partum <10

Iron deficiency anaemia

Comprises 80% of pregnancy anemia.

Daily Iron **absorption** = 1.5 – 2.5 mg.

Vitamin C ↑ Iron absorption.

- ✓ **Hb** concentration decreases.
- ✓ **MCV, MCH, MCHC** all will be ↓
- ✓ All can be calculated from RBC, Hb, and Packed cell volume.
- ✓ These tests are basic guides to a diagnosis in pregnancy.

↓ MCV, the most sensitive indicator of underlying Iron deficiency,

Hypochromia, and MCHC appear with more a severe degree of Iron deficiency.

Serum ferritin ↓

Total Iron binding capacity (high)

From 431 teams:

S. Ferritin, S. Fe & TIBC: it is not a routine test however you have to consider it if you suspect IDA in the CBC picture.

S.ferritn fall below 30 ug/l indicates early iron depletion - It is best single indicator of storage iron. - We check the patient's CBC even if she is not anemic we check - Ferritin is low because first iron stores become depleted and later on hemoglobin will be low

-If there is IDA in the mother can the fetus acquire it as well?

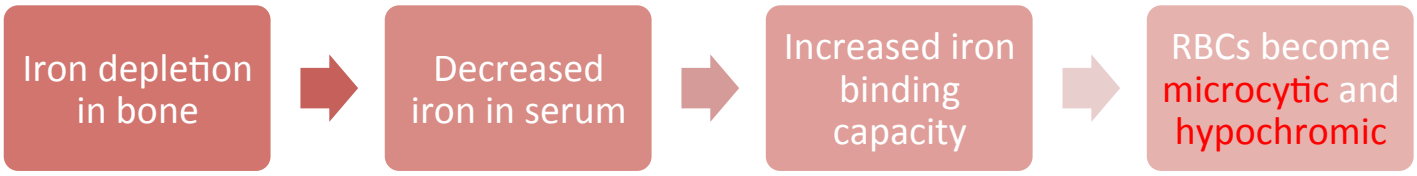
No, because there is active transport of iron across placenta

However the complication of IDA could be IUGR and preterm birth

Causes:

- Increased demand.
- Bleeding.
- Malabsorption.
- Excessive increase of demand (Pregnant with twins or more).

Pathophysiology:



Management:

- ✓ Confirm diagnosis;

  History, examination & investigation.

- ✓ Treatment depends on the degree of anemeia and gestational age (e.g. 16 weeks pregnant with Hb=9, there is time to raise the Hb with oral supplement till the delivery. In contrast to a 36 weeks pregnant women with Hb=8, where I have to raise the Hb quickly by IV, because she is expected to lose blood soon in her delivery)

Treatment:

- ✓ Nutrition
- ✓ Iron therapy, various forms, depends on:
  - Compliance of the woman.
  - Associated GIT symptoms.
  - Availability of medication.
  - Cost.

Oral Iron:

- ✓ ferrous fumerate, ferrous sulphate
- ✓ Does depends on the level of HB
- ✓ Supplement folic acid
- ✓ Give proper instructions
- ✓ Care if on thyroxin, calcium,

(To build up the Hb with oral supplement it takes 2-3 months

& IV iron, 3 weeks or 1 month maximum to raise the Hb effectively)

Iron is very irritant, so tell patients to take it after meals, and warn them that it might make their stool darker.

Injectable/ parenteral Iron therapy:

- Intramuscular (not preferable because it's very painful and might cause abcess)
- Intravenous infusion

(Most serious side effect of IV is anaphylactic reaction)

(Some women can't tolerate oral iron so we give them IV iron under observation as an in-patient).

The following statements about oral iron prophylaxis during pregnancy are correct:

1- Gastric side effects are does-related. (Most disturbing symptom is sever epigastric pain)

2- Iron absorption during the first trimester of pregnancy is decreased compared with non-pregnant state.

Usually we don't give medications during the first trimester (pregnant women usually have nausea in this period).

3- Non-compliance of the mother occurs in less than 10%.

4- Oral maternal iron prophylaxis is recognized to be associated with an increase in MCV.

Folic Acid deficiency anaemia:

- ✓ Macrocytic and usually accompanied with iron deficiency anemia.
- ✓ Water soluble, found in plants.

✓ All pregnant women are given Iron and Folic acid.

Causes:

- Dietary deficiency.
- Conditions associated with increased RBC turnover (thalassemia).
- Some medications (phenytoin).

Treatment:

1mg of Folic Acid is enough.

Haemoglobinopathies:

Sickle cell disease:

Is the name given to a group of inherited blood conditions, which include:

1. Sickle cell anaemia.
2. Sickle cell beta thalassemia.
3. Haemoglobin SC disease.

The most common and severe is Sickle cell anaemia

What causes sickle cell anaemia ?

This is an inherited <u>autosomal recessive</u> disease resulting in normal production of abnormal <u>globin chains</u>.

PATHOPHYSIOLOGY: Sickling of red cells with Hbs →sickle cell crisis. Ischemia and infarcts of different organs. → Pain → We have to see these patient more than normal pregnant women in order to prevent complications as they are more prone to have HTN , Premature labour, pre-eclampsia , abrptio placenta , post partum hemorrhage

Risk Factors:

Personal or family history of hemoglobinopathies.

African, southeast Asian, and Mediterranean ancestry.

Antenatal care:

Sickle cell trait (HbSA):

- may have UTI and microscpic haematuria' **pregnancy outcome is not changed.**

Sicle cell anameia :

- Bad obstetric history.
- Painful crises.
- Jaundice.
- Anaemia.
- Deformed pelvis Increase rate of operative deliveries; CS.
- Avascular necrosis of the hip.

Effect of Hemoglobinopathies on pregnancy:

Maternal

- Anemia
- Pregnancy-induced HTN
- Heart failure
- Painful crisis
- Acute chest syndrome
- Folate deficiency
- Dehydration
- Infections
- Embolism/ stroke
- Renal dysfunction
- Retinal disease
- Leg ulcers
- Choliothesis

Only With SS disease

Fetal

- **Intrauterine growth restriction**
- **Preterm labor**
- **Low birth weight**

Diagnosis

- Hb electrophoresis, not specific, Hb D, G.
- Sickling test, not specific, HbC Hb memphis.
- Hb solubility test, specific, cheap, rapid and simple.
- Reticulocytes.

USMLE Step 2 CK lecture notes

Screening Tests : These are peripheral blood tests used to detect the presence or absence of hemoglobin S. They do not differentiate between disease and trait

Diagnostic Test: A hemoglobin electrophoresis will differentiate between SA trait « 40% hemoglobin S) or SS disease (>40% hemoglobin S).

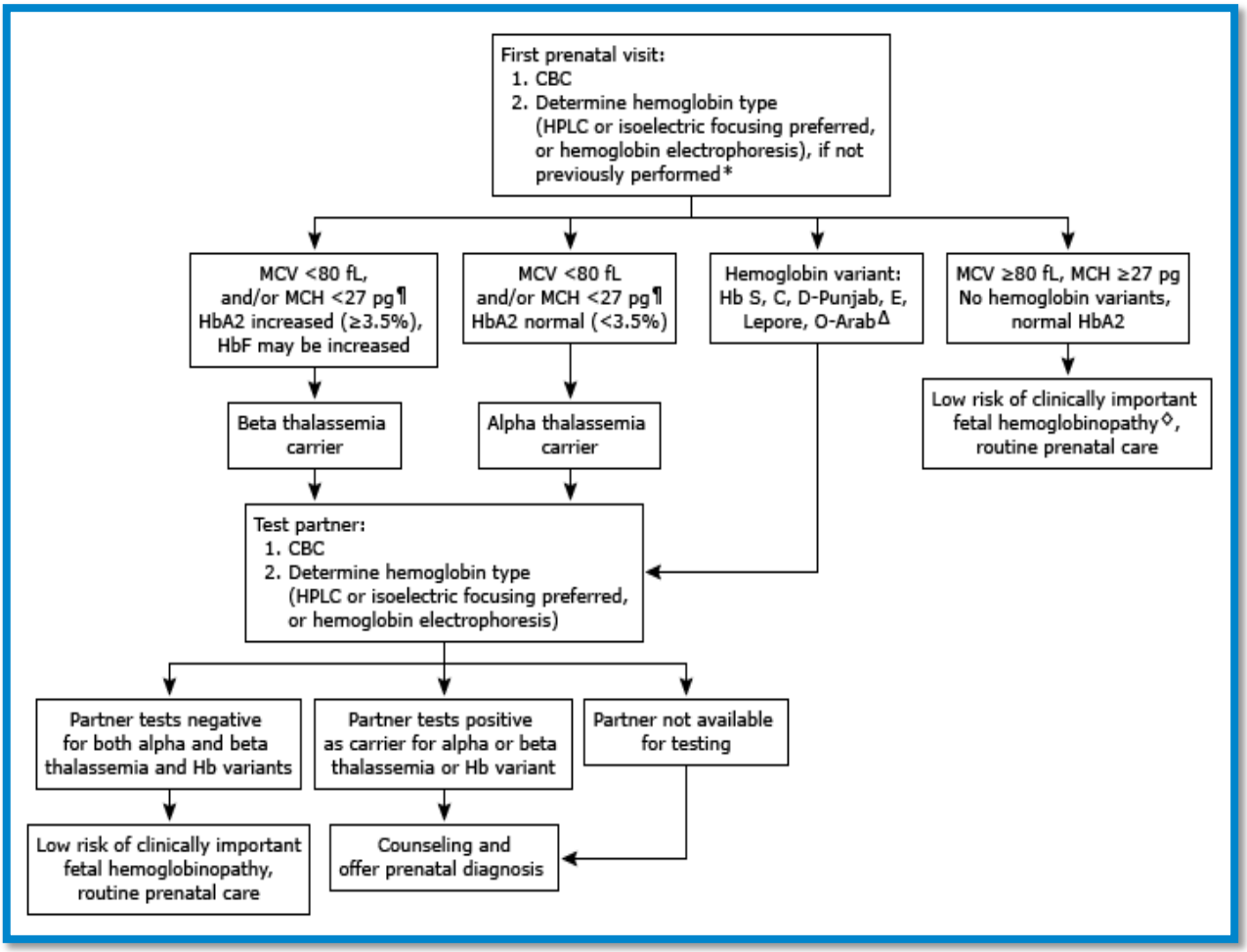
Screening for hemoglobinopathies:

Timing

- If not performed before pregnancy, hemoglobinopathy screening is most useful when performed early in pregnancy so that prenatal diagnosis, if indicated and desired, can be performed when parents have the option of terminating the pregnancy and are considering termination.

Laboratory

- Laboratory testing is the cornerstone of prenatal screening for hemoglobinopathy.



http://www.uptodate.com/contents/prenatal-screening-and-testing-for-hemoglobinopathy

- MSU (mid-stream specimen of urine for UTI)
- Blood pressure. Women with sickle cell trait –disease are at increased risk for preeclampsia- eclampsia. The condition most commonly shows up after 37 weeks, but in case of women with sickle cell trait –disease this condition usually appears earlier during the second trimester.
- Dip stick.
- Renal function.
- Liver function.
- Complete blood picture.

- Will they have Iron deficiency anaemia?

Folate and/or iron deficiency resulting from increased utilization of folate and enhanced urinary losses of iron. The net effect is that iron deficiency is present in approximately 20 percent of patients with sickle cell disease. The diagnosis of iron deficiency may be obscured by the elevated serum iron concentration associated with chronic hemolysis and the normal to increased mean corpuscular volume. A serum ferritin <25 ng/mL or an elevated serum transferrin should be used to make this diagnosis

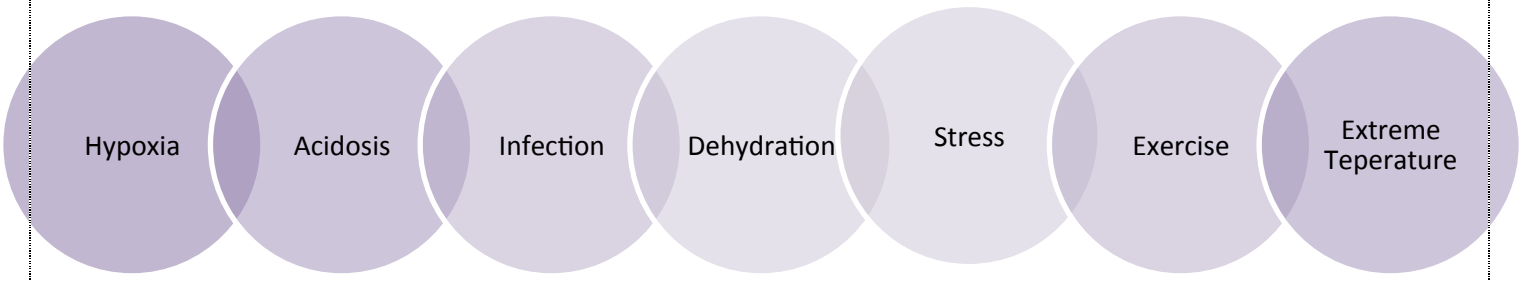
http://www.uptodate.com/contents/overview-of-the-clinical-manifestations-of-sickle-cell-disease

Fetal monitoring:

- USS (Ultrasound Scan) for viability <9 weeks
- USS (Ultrasound Scan) first trimester 11-14 weeks
- USS (Ultrasound Scan) detailed anomaly at 20 weeks
- Biometry every 4 weeks. Fetal biometry measures the baby's size. During an ultrasound, doctor measures the baby's head, body, and thigh bone. It helps to show baby's development.

http://www.webmd.com/baby/fetal-biometry

In pregnancy Avoid:



Management:

- ✓ Genetic counseling.
- ✓ Folic acid supplementation.
- ✓ Cesarean delivery (not recommended routinely).

- ✓ Epidural analgesia.
- ✓ Avoidance of triggers of painful crisis.
- ✓ Analgesia for painful crisis (e.g., opiates).
- ✓ Detection and treatment of acute chest syndrome, infection, dehydration, severe anemia, cholecystitis, and hypersplenism.
- ✓ Blood transfusion, including prophylactic exchange transfusion.
- ✓ Multidisciplinary management.
- ✓ Antenatal fetal surveillance (serial ultrasound, nonstress test, contraction stress test).
- ✓ Blood transfusion, keep Hb S level<40%, Keep Hb A level >60%.

Breastfeeding mothers with Sickle cell disease should be given a lot of fluid to prevent dehydration, which can trigger a crisis.

What to give:

Folate, because? Folic acid is given to all individuals in an oral dose of 1 mg daily. Folate deficiency has been found in several observational studies of patients with SCD.
Increased folate consumption from ongoing hemolytic anemia is often proposed as a rationale for the use of folic acid in these patients.
Aspirin , how much? Given the increased risk of preeclampsia, some authors suggest daily use of low dose (**75 mg**) aspirin to reduce this risk.
Heparin, what kind? For women who undergo cesarean delivery, we suggest postpartum prophylactic anticoagulation with **low molecular weight heparin**.

http://www.uptodate.com/contents/pregnancy-in-women-with-sickle-cell-disease

Vaginal delivery is encouraged, C/S is ↑ due to pelvic deformity , Continuous fetal monitoring due to impaired placental function People don't like to leave them more than 40 wks because the higher the mortality and the higher the rate to get placenta abruption so a lot of people if she didn't go into labor before 40 wks they may induce it In delivery get her hydrated , oxygenated and cross matched

Maternal sickle cell disease

- ✓ The spontaneous miscarriage is increased.
- ✓ The incidence of proteinuric hypertension increased.
- ✓ The incidence of spontaneous delivery is increased.
- ✓ The incidence of small for gestational age is unchanged.
- ✓ The presence of sickle cell disease in the fetus can not be diagnosed.

Perinatal mortality rates are adversely affected by:

- ✓ Alpha Thalassemia minor (Thalassemia doesn't have a major impact on pregnancy as compared to sickle cell disease).
- ✓ HbSS
- ✓ Beta Thalassemia minor
- ✓ HbSC
- ✓ Sickle cell thalassemia
- ✓ Sickle cell trait

Summary

Iron deficiency anaemia in pregnancy:

1- MCHC and MCV are low

2-There is usually chronic blood loss

3- Blood transfusion is indicated if the Hb is <9gm/dl.

4- There is increase risk of Pre-eclampsia.

5- There is no proven danger of teratogenicity from Iron therapy.

ANEMIAS	INVESTIGATION	MANAGEMENT
IDA	CBC + S.Fe, TIBC, and S.Ferretin which is the best indicator of iron storage Low hemoglobin, S.Fe, S.Ferretin Hypochromic microcytic High TIBC, RDW>15%	Iron tablets
SCA	Screening by sickling test Diagnostic by hemoglobin electrophoresis	In general try to avoid dehydration and fever to prevent end organ failure or any crisis and she should come to the hospital and treat every complain accordingly

MCQ's

1. A healthy 34-year-old G1P0 patient comes to see you in your office for a routine OB visit at 12 weeks gestational age. She tells you that she has stopped taking her prenatal vitamins with iron supplements because they make her sick and she has trouble remembering to take a pill every day. A review of her prenatal labs reveals that her hematocrit is 39%. Which of the following statements is the best way to counsel this patient?

A. Tell the patient that she is not anemic and therefore she will not need the iron supplied in prenatal vitamins.
B. Tell the patient that if she consumes a diet rich in iron, she does not need to take any iron supplements.
C. Tell the patient that if she fails to take her iron supplements, her fetus will be anemic.
D. Tell the patient that she needs to take the iron supplements even though she is not anemic in order to meet the iron demands of pregnancy.
E. Tell the patient that she needs to start her iron supplements if her hematocrit falls below 36%.

Answer

1. D

For mistakes or feedback

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