

ANEMIA IN PREGNANCY

1. DEFINITION

Anemia is defined as a hemoglobin level
<11g/dl in the first trimester
<10.5g/dl in second and third trimesters
<10g/dl in postpartum period.

It can be subdivided in to three categories according to severity

Severity	Hemoglobin
Mild	10.0g/dl to 10.9 g/dl(1st trimester) 10.0g/dl to 10.5g/dl(2 nd & 3 rd trimesters)
Moderate	7 - 9.9 g/dl
Severe	< 7 g/dl

2. CAUSES

- The main cause is nutritional iron deficiency. The absorption of iron is less in the first trimester and increases from the second trimester on wards. Anemia is the end-point of iron deficiency and indicates depletion of iron stores in the body. Therefore a non-anaemic woman could be deficient in iron. Additionally, there may be multiple nutritional deficiencies (e.g. folate, vitamin B₁₂)
- Hereditary: haemolytic anaemias- Thalassemias , Hereditary spherocytosis
- Acquired- autoimmune haemolytic anaemia
- Hemorrhagic – Helminthiasis, history of bleeding per rectum or heavy menstrual bleeding

- Chronic conditions - TB , Rheumatoid Arthritis, Hypothyroidism, malignancies, chronic renal disease

*Recognized risk factors for anemia include multifetal gestation, teenage pregnancy, high parity, short birth interval

3. SCREENING FOR ANEMIA IN PREGNANCY

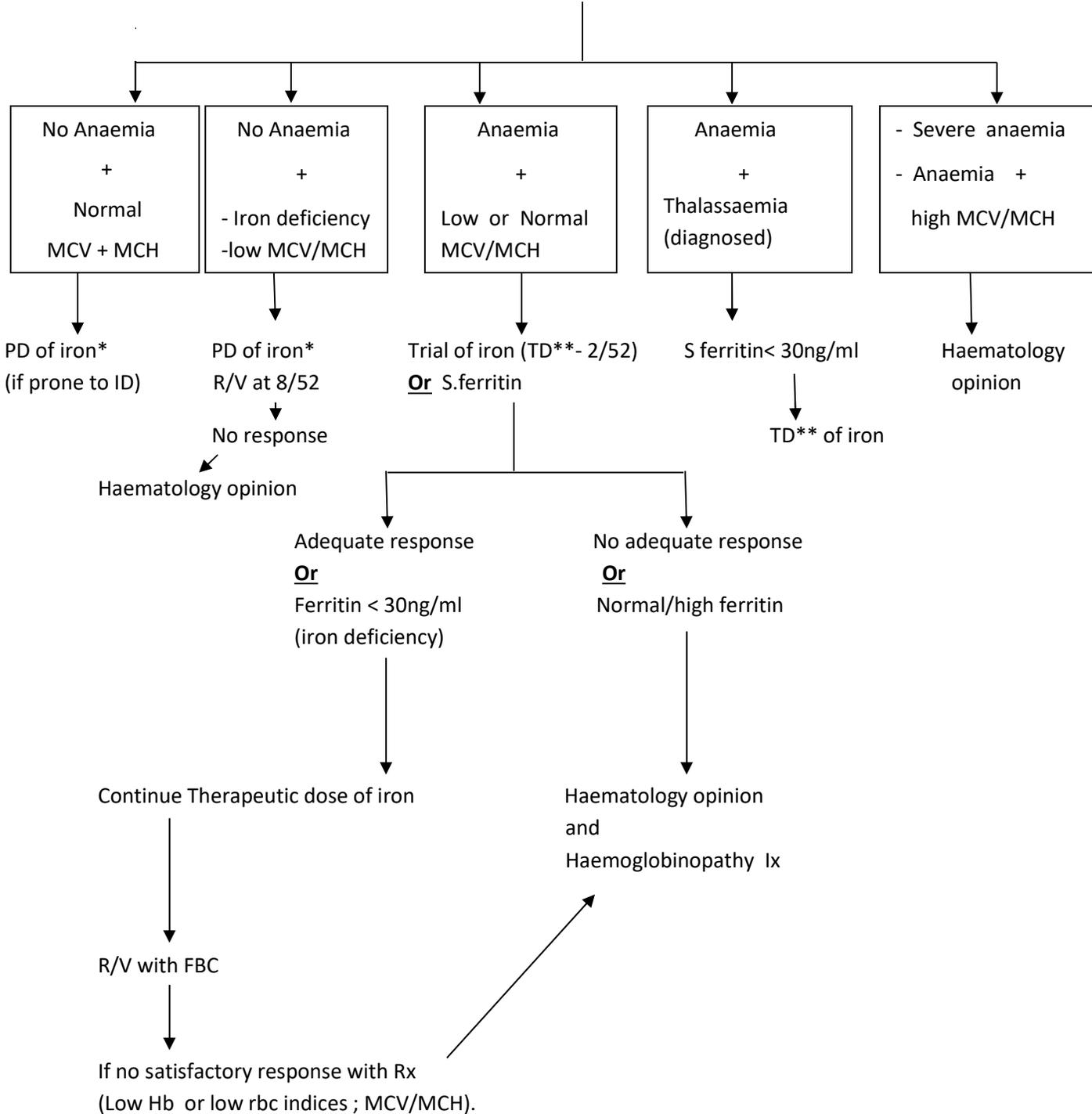
- A full blood count (FBC) with red cell indices is recommended in preference to a single parameter (such as hemoglobin concentration) at the **first antenatal visit** and at **28 weeks**.

For women at high risk of anemia in pregnancy such as multifetal gestations, an additional evaluation at 20-24 weeks is recommended.

The summary is given below as a flow chart, and for details please see the text.

Booking Visit (T1)

Full Blood Count (FBC)



PD *- Prophylactic Dose of iron treatment (65 mg/Day)

TD **- Therapeutic dose of iron treatment (100- 200 mg of elemental iron per day in divided doses)

4. Management of a woman with anemia

Management will depend on

- Severity and presence of symptoms
- Period of gestation
- Previously diagnosed hemoglobinopathies
- Other comorbidities.

4.1 A **trial of oral iron should be considered** as the first line diagnostic test for **normocytic or microcytic anaemia**. An increase in Hb must be demonstrated at 2 weeks, otherwise further tests are needed . A rise in hemoglobin level for a therapeutic trail is 2g for 3-4 weeks. (this increment depends on iron absorption, loss) .This initial step may even be tried in a field setting.

4.2 Inquiry should be made about dietary habits and sources of chronic blood loss such as hemorrhoids and appropriate action should be taken.

4.3 Antihelminthic treatment should be offered to women who have not so far taken it.

4.4 Women with severe anemia must be referred to a specialist obstetric unit immediately.

4.5 The aim of management is to achieve a hemoglobin level $\geq 10\text{g/dl}$ by the time of delivery.

Therefore a woman presenting at ≥ 38 weeks with a hemoglobin level of 9g/dl or less may require blood transfusion to achieve this.

Intravenous iron therapy may be considered in anemic women with iron deficiency who present between 36 – 38 weeks (refer below for details).

4.6 FBC prior to discharge from hospital is recommended in women who have been anemic during pregnancy or those who have had multiple pregnancies or postpartum hemorrhage. Appropriate management and follow up should be arranged for these women.

5. Management of women who fail to respond to a trial of therapeutic iron

5.1 Women who fail to respond satisfactorily should be referred to a Haematologist for further assessments to establish the underlying cause.

5.2 The following investigations are recommended:

- Full blood count

- Blood picture

- Serum ferritin

Indicators of iron deficiency are given in Table 2

Full blood count	Hemoglobin	<10.5/11 g / dl
	Hematocrit	<33 %
	MCV	<80 fl
	MCH	<27pg
	MCHC	<30g/dl
Serum ferritin		<30µg /l
Blood picture		Microcytic hypochromic picture with other features

Table 2

5.3 The serum ferritin level is the most useful and easily available parameter for assessing iron deficiency. Levels below 15 µg/l are diagnostic of established iron deficiency. A level below 30 µg/l in pregnancy should prompt treatment

Total iron binding capacity, serum iron, transferrin saturation, red cell count and red cell distribution width are not recommended indices in the diagnostic work up.

5.4 Multiple nutritional deficiencies could coexist (e.g. iron and folate deficiency). A peripheral blood picture would show a polymorphic picture in these situations. A high MCV (≥ 100 fl) is indicative of folate or rarely vitamin B₁₂ deficiency, haemolysis.

6. ANTENATAL SUPPLEMENTATION

- 6.1 The current recommendation of peri-conceptual supplementation of
- 6.2 folic acid 1 mg should be continued during the first trimester
- 6.3 A daily oral supplement of 60 mg of elemental iron and a minimum of 400µg of folate is recommended for all non-anemic pregnant women (however routine prophylaxis of oral iron is not recommended for its category in the UK)
- 6.4 This is recommended to be started as soon as possible after the gastrointestinal side effects of early pregnancy have decreased (e.g. by 12 weeks of gestation)
- 6.5 It is important that women are advised that the iron supplements be stored in a dry, dark airtight container.
- 6.6 It is also important that they be advised that it should be taken at least one hour before a meal or 2 hours after a meal together with the 50 mg vitamin C tablet.
- 6.7 Tea, coffee and dairy products should not be consumed within an hour before and after the iron supplement.
- 6.8 Women should be advised that the calcium supplement be taken after a meal and not with the iron supplement

7. TREATMENT OF IRON DEFICIENCY ANEMIA IN PREGNANCY

7.1 Oral iron therapy

- Women with **established iron deficiency anaemia** should be given **100-200mg** elemental iron daily.
- Once Hb is in the normal range, supplementation should continue for **three months** and at least until **6 weeks postpartum** to replenish iron stores

- Women with **known haemoglobinopathy** should have serum ferritin checked and offered oral supplements if their ferritin level is **<30 ug/l**
- **Non-anaemic iron deficient women** should be offered 65mg elemental iron daily, with a repeat Hb and serum ferritin test after 8 weeks.
- Anti-helminthic treatment and dietary advice should be given
- If a woman develops gastrointestinal side effects to oral iron supplements, it is recommended that the dose be lowered. Enteric coated or slow-release formulations are not encouraged.

7.2 Intravenous iron therapy

- Intravenous iron therapy should be considered for women with iron deficiency who fail to respond to oral iron therapy, those who are non-compliant and in those with proven malabsorption.
- Facilities for management of anaphylaxis must be available.
- The dose is calculated based on the hemoglobin deficit and body weight and according to manufacturer's recommendations.
- The maximum recommended daily and weekly doses must not be exceeded
- Contraindications include use in first trimester and a previous history of allergic reactions to parenteral iron therapy
- The routine supplementation dose (60 mg daily) should be continued up to three months postpartum

7.3 Blood transfusion

Depends on the multidisciplinary/local guidelines for criteria for transfusion in anaemia in women who are not actively bleeding.

- Blood transfusions should be given only if absolutely essential
Due to transfusion associated risks. Risk of allo -immunization is higher during pregnancy.
- Blood transfusion must be considered in women with a hemoglobin level less than 7.0 g/dl at any period of gestation, to achieve a target of 10 g/dl.
- It may also be required in women who have features of cardiac decompensation even at higher levels of hemoglobin
- Blood should be obtained for investigations including a blood picture before commencement of transfusion
- Therapeutic oral iron (120 mg per day) should be continued as described above

8. ADDITIONAL PRECAUTIONS DURING LABOR IN WOMEN WITH A HEMOGLOBIN LEVEL BELOW 10g/dl

- Be aware of higher risks of postpartum hemorrhage
- Delivery should preferably be in a specialist unit where facilities for transfusion are available
- Ensure intravenous access
- Ensure availability of compatible blood
- Avoid prolonged labor

Refer to a higher care center

1. Hb<7g/dl
2. Anaemia in >34/52

Delivery

Suggested Hb cut-offs

<10g/dl for delivery in hospital

<9.5g/dl for delivery in an obstetrician-led unit

9. REFERENCES

Management of iron deficiency in Pregnancy

S Pavord, Bethan M, Robinson S et al., - British Committee for Standards in Haematology UK guidelines - 2011