

Pregnancy with Anaemia

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ABSTRACT: In more than% of countries in the world, the prevalence of anaemia in pregnancy is >20%, and is a major public health problem. More than 56 million women are estimated to be affected globally, approx 32 million of them being from Asia. The global prevalence of anaemia in pregnancy is estimated to be approximately 41.8%, varying from a low of 5.7% in the USA to a high of 75% in Gambia. Some women are anaemic prior to the index pregnancy and others become progressively anaemic during pregnancy. In the USA, anaemia in pregnancy was estimated to increase from 1.8% to 8.2% and 27.4% in the first, second and third trimesters respectively

Anaemia in pregnancy, defined as a haemoglobin concentration (Hb) < 110 g/L, affects more than 56 million women globally, two thirds of them being from Asia. Multiple factors lead to anaemia in pregnancy, nutritional iron deficiency anaemia (IDA) being the commonest. Underlying inflammatory conditions, physiological haemodilution and several factors affecting Hb and iron status in pregnancy lead to difficulties in establishing a definitive diagnosis. IDA is associated with increased maternal and perinatal morbidity and mortality.

I. PHYSIOLOGICAL CHANGES IN THE RED CELL DURING PREGNANCY

Pregnancy is a state of haemodilution due to intravascular volume expansion that starts at 8 to 10 weeks gestation and reaches its maximum during second trimester, Thus a state of physiological anaemia exists during pregnancy. Thus, there is not only a fall in haemoglobin concentration and haematocrit value in second half of pregnancy but also a low serum iron, increased iron binding capacity and increased rate of iron absorption.

II. CLASSIFICATION OF ANAEMIA

1. Physiological anemia of pregnancy
2. Pathological anaemia

(a) Deficiency anaemia

- Iron deficiency
- Folic acid deficiency
- Vitamin B12 deficiency
- Protein deficiency

(b) Haemorrhage

- Acute – Bleeding due to obstetric and non-obstetric causes
- Chronic – Hookworm infestation, bleeding piles.
- Haemolytic causes – Familial-congenital achloric jaundice, sickle cell anaemia. Acquired-Malaria, severe infection
- Bone Marrow insufficiency – Hypoplasia or aplasia due to radiation drugs, infection.
- Haemoglobinopathies

Of these the main cause is **iron deficiency anaemia**

Those women in whom iron reserve is already inadequate are at increased chance of anaemia due to

1. Increased demands of iron- due to growing fetus, sometimes multiple pregnancy, early pregnancies.
2. Diminished intake of iron- due to socioeconomic factors, faulty dietetic habits, loss of appetite and vomiting in pregnancy.

III. DIAGNOSIS OF ANAEMIA

Clinical features – History of Lassitude, feeling of exhaustion, anorexia, palpitation, dyspnea giddiness, swelling of legs raise suspiciousness.

On examination – There is pallor, oedema of legs, soft systolic murmur due to physiological mitral incompetence.

Investigation – These are directed at finding degree of anaemia, type of anaemia and cause of anaemia.

The relevant investigations are :

1. **Haemoglobin estimation** : Anaemia can be graded as mild when Hb is between 8-10 gm %, moderate 6.5-8 gm % and severe when Hb is less than 6.5 gm %.
2. **Peripheral blood smear** : It is useful for finding type of anaemia. If it is iron deficiency, the smear looks pale, hypochromic and microcytic. In megaloblastic anaemia there would be macrocytosis, hypersegmentation of neutrophils, and fully haemoglobinised red blood corpuscles. In haemolytic anaemia there would be target cells, reticulocytes and sickle cells.

If haemoglobin is less than 5 gm % , therapy should be initiated only when type of anaemia is diagnosed. It is dangerous to give parenteral iron if it is haemolytic or megaloblastic anaemia. Serum iron, total iron binding capacity of the serum, serum ferritin, serum folate and B12, Bone marrow are some of the investigations needed to confirm type of anaemia. Various blood indices in anaemia are shown in table below.

Investigation	Normal value
Serum iron	100 ug/dl
Total iron binding of serum	300-350 ug/dl
Serum ferritin	40-340 ng/ml in male 14-150 ng/ml in female
Serum folic acid	5-15 ng/ml
Red blood cell folate	> 1.9 ng/ml
Serum B12	140-820 pg/ml

Blood indices in Nutritional Anaemia

Blood Indices	Normal	Iron deficiency	Folate & B12 deficiency
MCV (M3)	75-100	< 75	110/ 140
MCH MM	24-33	< 25	33-40
MCHC (%)	30-36	< 30	32-38

Complications of severe anaemia

During pregnancy: There are increased chances of preeclampsia, intercurrent infection, heart failure and preterm labor.

During labor: There are chances of postpartum haemorrhage, cardiac failure and shock.

During puerperium : There are increased chance of puerperal sepsis, sub involution, failing lactation, puerperal venous thrombosis ,pulmonary embolism.

Treatment

1. **Prophylactic** : The prophylaxis includes avoidance of frequent child births and too early births.
2. **Supplementary iron therapy** : Women should be given at least 200mg ferrous sulphate(containing 60 mg elemental iron) and 1 mg folic acid at least 100 days.
3. **Adequate treatment of infections** likely to cause anaemia like hookworm, dysentery malaria, bleeding piles, urinary tract infection.

Curative treatment : The choice of treatment depends on

1. Severity of anaemia
2. Duration of pregnancy
3. Associated complicating factors.

Choice of iron preparation

Oral route:

Iron is best absorbed in ferrous form and any ferrous preparation available as tablet or capsule can be prescribed. Besides these various new preparations like carbonyl iron , iron polymaltose complex, iron ferrededate salt, iron ascorbic acid have been introduced and are claimed to have high absorption rates, better bio availability and less incidence of side effects. Besides problem of noncompliance is also there, it is known that some women tolerate iron preparation of a particular pharmaceutical company and develop reaction or intolerance to other preparation. Clinicians must respect patients perceptions and feelings and should provide proper counselling, build the dose slowly, gradually

increase the dose, change the brands of iron preparation and provide sympathy and reassurance. It is advisable to take oral iron preparations, 3-4 months after the haemoglobin values become normal.

Parenteral iron preparations: These are required in case of

1. Genuine gastrointestinal problem or intolerance to oral iron.
2. Patient can not be relied upon to take oral preparation.
3. Problem of malabsorption present.
4. Severe anaemia in advanced pregnancy considering the unpredictable absorption and utilization following oral therapy.

Advantages: It is advantageous due to certainty of administration and expected rise of Haemoglobin is 0.7-1 gm /100 ml/ week.

It can be given in two ways :

1. Intramuscular route
2. Intravenous route – total dose infusion & repeated injections

Intramuscular route : The compound used are

1. Iron dextran (Imferon)
2. Iron sorbitol citric acid complex in dextran (Jectofer)

Both these contains 50 mg of elemental iron in one ml. Total dose of iron sorbitol complex os to be adjusted because of its 30 % excretion in urine. Orla iron is suspended at least 24 hours prior to therapy.

The initial test dose of 1 ml is given followed by injections given deep in upper outer quadrant of buttock.

These injections are painful and chances of abscess formation, discoloration of skin are present apart from allergic reactions like pyrexia and lymphadenopathy.

Intravenous therapy: In this iron dextran is used. The dose required can be calculated as $0.3 \times w (100 - \text{Hb} \%) = \text{patients weight in pounds}$, (Hb% observed Hb concentration in percentage). Additional 50 % is added for partial replacement of body store iron.

The required iron is mixed with 500 ml of 0.9% saline and drip rate is adjusted and drip given.

Recently a new molecule iron sucrose is available IV injection. It is without side effects and does not require testing dose for anaphylaxis.

Blood transfusion: It is required in following cases

1. To correct anaemia due to blood loss.
2. Patients with severe anaemia in later months of pregnancy.
3. Refractory anaemia not responding to any form of iron.
4. Associated injection.

The Blood transfused should be fresh collected within 24 hours properly typed and grouped. Only packed cells are transfused. In severe anaemia overloading of heart is avoided and negative balance attained by injection Frusemide. Observe for any transfusion reaction.

Management during labor

The main object is to prevent death due to anoxemia and cardiac failure. The blood volume is already high and further increase in volume may precipitate further crisis . Oxygen should be administered. Patient should be given light sedation to prevent excitement. She should not be allowed to bear down in second stage of labor and outlet forceps or vacuum is advisable. There is risk of puerperal infection and hence prophylactic antibiotics should be given. Delaying the clamping of the umbilical cord for 1–2 minutes improves the iron stores of the neonate.

Postpartum management

If the post partum Hb is less tha 8 mg/dl blood transfusion should be considered.

IV. CONCLUSION

The incidence of anemia increases among antenatal mothers. Early detection and management strategies should be adopted to prevent complications. Research studies should be conducted to assess the needs of pregnant women. The main focus of research studies should be behavior modification of individual. The approach of primordial prevention should be adopted, which involves preventing anemia and spread of risk factors and lifestyle modification through health education programs conducted by the nursing personal both in hospital and community. The nurse and health workers can distribute iron and folic acid supplements to the antenatal mothers

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