GUIDELINES FOR PREVENTION OF MATERNAL ANAEMIA

As one of the important factors influencing maternal morbidity and mortality and also the health of the newborn, anaemia has defied over three decades of public health intervention and continues to affect a majority of pregnant women in the state. Anaemia in pregnancy is associated with high maternal morbidity and mortality.

Maternal anaemia is associated with poor intra-uterine growth and conceiving of low-birth-weight babies. This in turn could result in higher perinatal morbidity, infant mortality, developmental delays, reduction of placental weight, volume and surface area. There is a striking difference in the mean birth weight of the infants born of anaemic and non-anaemic mothers. This has resulted in 12 to 28 percent of foetal loss, 30 percent of perinatal deaths and 7 to 10 percent of neonatal deaths. Anaemia during the second trimester is associated with preterm birth. Preterm delivery is increased fivefold for iron deficiency anaemia and doubled for other anaemia. Fifteen to twenty percent of maternal deaths are directly or indirectly due to anaemia and the mortality is higher if postpartum haemorrhage occurs in anaemic mothers.

Causes for anaemia in women

- Low bio-availability of iron in food
- Inadequate intake of iron rich foods
- Excess consumption of coffee/tea
- Chronic infections like malaria, TB
- Inadequate intake of folate.
- Inadequate intake of Vitamin B12.
- Worm infestation
- Menstrual loss of blood
As the maternal anaemia is the serious concern for the state, for the prevention and control of anaemia and for provision of quality antenatal care, the expert committee/groups were formed in collaboration with State EmOC Nodal center and after various deliberations the expert committee has recommended suitable strategies with the following guidelines for the prevention and control of anaemia during pregnancy.

**Classification of Anaemia (ICMR-1989)**

<table>
<thead>
<tr>
<th>Hb level</th>
<th>Classification</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;4g/dl</td>
<td>Very severe</td>
</tr>
<tr>
<td>4-6.9 g/dl</td>
<td>Severe</td>
</tr>
<tr>
<td>7-9.9 g/dl</td>
<td>Moderate</td>
</tr>
<tr>
<td>10-10.9 g/dl</td>
<td>Mild</td>
</tr>
</tbody>
</table>

### a. Compulsory Haemoglobin estimation

Compulsory Haemoglobin estimation by Cyanmeth-haemoglobin method by using Semi-autoanalyser or photo calorimeter at 14-16 weeks, 20-24 weeks, 26-30 weeks and 30-34 weeks of pregnancy for all pregnant mothers (minimum four Hb estimations). The interval between one haemoglobin estimation and another should have a minimum of four weeks.

### b. Deworming at 14-16th week of gestation (Second Trimester)

*All pregnant women at 14-16th week during the second trimester should be given one tablet of Albendazole 400mg – single dose.*
I. At 14-16 weeks

First Hb estimation has to be done at 14-16th week for all the antenatal mothers

- **If the Hb is more than 11 gms**, give prophylactic dose of IFA tablets.

- **If the Hb is 7.1-10.9 gms%**, give therapeutic dose of IFA tablets.

- **If the Hb is less than 7 gms%**, she has to be referred to CEmONC centres for Blood transfusion and further management.

Iron in the form of Ferrous Sulphate is the best choice. Preventive/therapeutic form of oral iron therapy should be started after deworming.

**Prophylactic dose:** Tab.IFA (100 mg. of iron with 0.5mg of folic acid) once daily for 100 days.

**Therapeutic dosage:** Tab.IFA twice daily for 100 days

II. At 20-24 weeks

Second Haemoglobin estimation has to be done between 20 and 24 weeks of gestation for all AN mothers.

- **If the Hb is more than 11 gms**, give prophylactic dose of IFA tablets.

- **If the Hb is 9-10.9 gms%**, give therapeutic dose of IFA tablets.

- **If haemoglobin level is between 7.1 to 8.9 gm/dl. IV** Iron sucrose infusion has to be given.
Intra venous infusion of Iron sucrose – 100 mg. in 100 ml of Normal saline infused over 20 -30 minutes once a day x 4 days over a period of 2 weeks (with 2-4 days of interval between each infusion)

Discontinue oral iron therapy while IV iron sucrose infusion till next Hb estimation and decision (after 4 weeks of Iron sucrose infusion). Vitamin supplementation need not be withheld.

- If the Hb is less than 7 gms%, she has to be referred to CEmONC centres for Blood transfusion and further management.

III. At 26-30 weeks

Third Haemoglobin estimation has to be done between 26 and 30 weeks of gestation for all AN mothers. For Ante-natal mothers infused with iron sucrose infusion during 20-24 weeks, Haemoglobin estimation has to be done after one month.

- If the Hb is more than 11 gms, assure and counsel to continue with prophylactic dose of IFA tablets.

- If the Hb is 9-10.9 gms%, assure and counsel the mother for further improvement of Hb% and continue with therapeutic dose of IFA tablets.

- If the Hb is 7.1 -8.9 gms%

  - For mothers who received iron sucrose infusion, give two top up doses of 100 mgs of Iron sucrose infusion with 2-4 days interval between each infusion.

  - For mothers who had not received Injection iron sucrose earlier during current pregnancy, give four
doses of iron sucrose injection (100 mg. in 100 ml of Normal saline infused over 20-30 minutes once a day x 4 days over a period of 2 weeks with 2-4 days of interval between each infusion).

- **If the Hb is less than 7 gms%,** she has to be referred to CEmONC centres for Blood transfusion and further management.

### IV. At 30-34 weeks

All AN mothers have to be subjected to Hb estimation at 30-34 weeks irrespective of mode of management of anaemia previously.

- **If the Hb is more than 11 gms,** assure and counsel to continue with prophylactic dose of IFA tablets

- **If the Hb is 9-10.9 gms%,** assure and counsel the mother for further improvement of Hb% and continue with therapeutic dose of IFA tablets.

- **If the Hb checked at 30-34 weeks does not improve (still less than 9 gms%),** refer to higher institution for blood transfusion and further management.

### GENERAL GUIDELINES

**a) Trigger point for referral to higher institution**

a. Hb level of 7 gm% of haemoglobin at 14 weeks, 20-24 weeks, 26-30 weeks

b. Hb level of 9 gms% at 30-34 weeks

**b) History**

a. History of repeated blood transfusions have to be asked for excluding haemoglobinopathies and bleeding diathesis.
b. Previous history of any allergic reactions to any drug, bronchial asthma have to be asked.
Injection Iron Sucrose to be avoided in these women.

c) **Tests to be done**
   a. Hb estimation by Cyanmeth-hemoglobin method using semi-autoanalyser or photo calorimeter is mandatory in all institutions.
   b. Peripheral smear, MCV/RBC ratio, Serum iron binding capacity may be done in medical college, DHQ Hospitals and institutions with facilities for these tests.
   c. To rule out refractory anemia, urine should be checked for albumin, sugar and deposits. If deposits are more than 4-6 cells, then urine culture should be done.

d) **Safety aspects emphasised**
   a. Infusion has to be completed within 30 minutes to avoid the release of free radicals. During the first 5 minutes give the infusion at the rate of 20-30 drops per minute. Then increase the rate of infusion to 80-90 drops per minute.
   b. Like any other drug, expiry date has to be confirmed before administration
   c. With respect to Normal Saline, the following points to be checked
      a. If any leakage is found, the bottle should be discarded
      b. Colour change, visible particles to be looked for. If any noticed such bottles to be discarded.
      c. While giving iron sucrose injection care should be taken not to allow extravasation of iron sucrose. To prevent this needle/venflon has to be secured (in position) correctly.
      d. Always look for the dosage content in the ampoules. If the ampoule contains 50 mg. of iron, 2 ampoules to be used. If the ampoule contains 100 mg of iron 1 ampoule to be used. Total dose should be 100 mg. of iron in 100 ml of normal saline for infusion at a time.
   d. Standard Emergency tray should be made available at the bedside for handling any reactions.
e. Pulse and BP to be recorded before, during and after the administration of Inj. Iron Sucrose infusion
f. If any reaction is suspected, stop the infusion and treat for the reactions.

List of items to be available is given in the annexure-3.

**e) Diet counselling**
All the mothers should be encouraged to take iron rich foods and avoid coffee and tea.

**f) Vitamin supplementation**
Water soluble vitamins like folic acid, B12 need not be withheld during iron sucrose infusion.

**g) Case sheets as** in annexure-4 have to be maintained in every institution for proper follow-up care.

**h) Monthly stock and utilisation** report should be sent in the format enclosed- annexure-5.
GUIDELINES FOR MANAGEMENT OF MATERNAL ANAEMIA
FLOW CHART

I. AT 14-16 WEEKS OF GESTATION:-

Deworming with one 400 mg. of Tablet Albendazole after meals at 14-16 weeks

First estimation of Blood Haemoglobin at 14-16 weeks of gestation by cyanmeth-haemoglobin method using semi-auto analyser or photocolorimeter

If Blood Hemoglobin level more than 11 gm/dl.

If Blood Hemoglobin level between 7.1-10.9 gm/dl.

If Blood Hemoglobin level less than 7 gm./dl.

Refer to Higher Institutions (CEmONC centres) for Blood transfusion and further management

✓ Therapeutic dose of Tablet Ferrous sulphate 100 mg. of elemental iron 1 bd. with 0.5 mg. of folic acid
✓ 1 Tablet of Vitamin B12 15mcg. And Vitamin C 100 mg./od. to be supplemented.

✓ Preventive dose of Tablet Ferrous sulphate 100 mg. of elemental iron 1 od. 0.5mg of folic acid
✓ 1 Tablet of Vitamin B12 15mcg. And Vitamin C 100 mg./od. to be supplemented.
* If the AN registration done earlier than 14 weeks then oral iron to be started from 12 weeks onwards.

II. AT 20-24th WEEK OF GESTATION:-

**Second estimation of Blood Hemoglobin** at 20-24 weeks of gestation after the consumption of preventive/therapeutic dose of iron

- **If Blood Hemoglobin level less than 7 gm./dl.**
  - Refer to Higher Institutions (CEmONC centres) for Blood transfusion and further management

- **If Blood Hemoglobin level between 7.1-8.9 gm./dl.**
  - ✓ **Injection iron sucrose infusion *** intra venous – 4 doses of 100 mg. for 4 days over a period of 2 weeks with 2-4 days interval between each dose.**

- **If Blood Hemoglobin level is 9-11 gm./dl.**
  - ✓ Continue with therapeutic dose of Tablet Ferrous sulphate 100 mg. of elemental iron 1 bd.
  - ✓ 1 Tablet of Vitamin B12 15mcg. And Vitamin C 100 mg./od.

- **If Blood Hemoglobin level is more than 11 gm./dl.**
  - ✓ Continue with preventive dose of Tablet Ferrous sulphate 100 mg. of elemental iron 1 od.
  - ✓ 1 Tablet of Vitamin B12 15mcg. And Vitamin C 100 mg./od.
** Not to give oral iron while giving IV iron sucrose infusion. i.e., oral iron to be withheld till the 3rd estimation of Haemoglobin results

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- If there is any allergic reaction like urticaria which can be treated with 100 mg. hydrocortisone (1 ml. IV).
- While giving iron sucrose injection care should be taken not to allow extravasation of iron sucrose. To prevent this, venflon has to be secured (in position) correctly.

▲ Specification - If the ampoule contains 50 mg. of iron, 2 ampoules to be used. If the ampoule contains 100 mg of iron 1 ampoule to be used. Total dose should be 100 mg. of iron in 100 ml of normal saline for infusion at a time.
III. AT 26-30 WEEKS OF GESTATION:-

Third estimation of Blood Hemoglobin after 1 month of the above 4 doses (not later than 30 weeks)

- If Blood Hemoglobin level **less than 7 gm./dl.**
  - Refer to Higher Institutions (CEmONC centres) for Blood transfusion and further management
  - Not Received Inj. Iron sucrose earlier in the current pregnancy
    - ✓ Injection iron sucrose infusion *** intra venous – 4 doses of 100 mg. over a period of 2 weeks with 2-4 days interval.

- If Blood Hemoglobin level is **7.1-8.9 gm./dl.**
  - Received Inj. Iron sucrose earlier in the current pregnancy
  - Assure and counsel the mother for the further improvement of Blood Hemoglobin level and to continue **** oral iron supplementation till delivery

- If Blood Hemoglobin level is **9-11 gm./dl.**
  - Two top up doses of Injection iron sucrose infusion intra venous – 100 mg(each) in 100 ml. of normal saline for 30 min. only (with 2-4 days interval between each dose)

- If Blood Hemoglobin level is **more than 11 gm./dl**
  - ✓ Continue with preventive dose of Tablet Ferrous sulphate 100 mg. of elemental iron 1 od.
  - ✓ 1 Tablet of Vitamin B12 15mcg.
  - And Vitamin C 100 mg./od.
***Continue preventive dose of iron (100 mg. of elemental iron) + 0.5 mg. of folic acid till delivery.

**IV. AT 30-34 WEEKS OF GESTATIONS:**

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**Estimation of Blood Hemoglobin at 30-34 weeks of gestation**

- **If Blood Hemoglobin level less than 7 gm/dl.**
  - Refer to Higher Institutions (CEmONC Centres) for Blood transfusion and further management

- **If Blood Hemoglobin level is 7.1-8.9 gm/dl.**
  - Refer to Higher Institutions (CEmONC Centres) for Blood transfusion And further management

- **If Blood Hemoglobin level is 9-11 gm/dl.**
  - Assure and counsel the mother for the further improvement of Blood Hemoglobin level and to continue ***oral iron supplementation till delivery***

- **If Blood Hemoglobin level is more than 11 gm/dl.**
  - ✓ Continue with preventive dose of *
    - Tablet Ferrous sulphate 100 mg. of elemental iron 1 od.
  ✓ 1 Tablet of Vitamin B12 15mcg.
  - And Vitamin C 100 mg./od.

***Continue preventive dose of iron (100 mg. of elemental iron) + 0.5 mg. of folic acid till delivery.***