WOMEN'S HEALTH AND PAEDIATRICS

MATERNITY UNIT

Iron Deficiency Anaemia (IDA) in Pregnancy

Amendments			
Version	**Date**	**Comments**	**Approved by**
1	April 2021	New guideline now incorporates Monofer guideline	Perinatal Guidelines group
2	February 2022	Minor changes to pathway for low ferritin and timing of follow up	Perinatal Guidelines group

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In consultation with: Perinatal Governance Group

Ratified by: Perinatal Governance Group

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Target audience: All health professionals within the maternity services

Equality impact assessment: Perinatal Governance Group

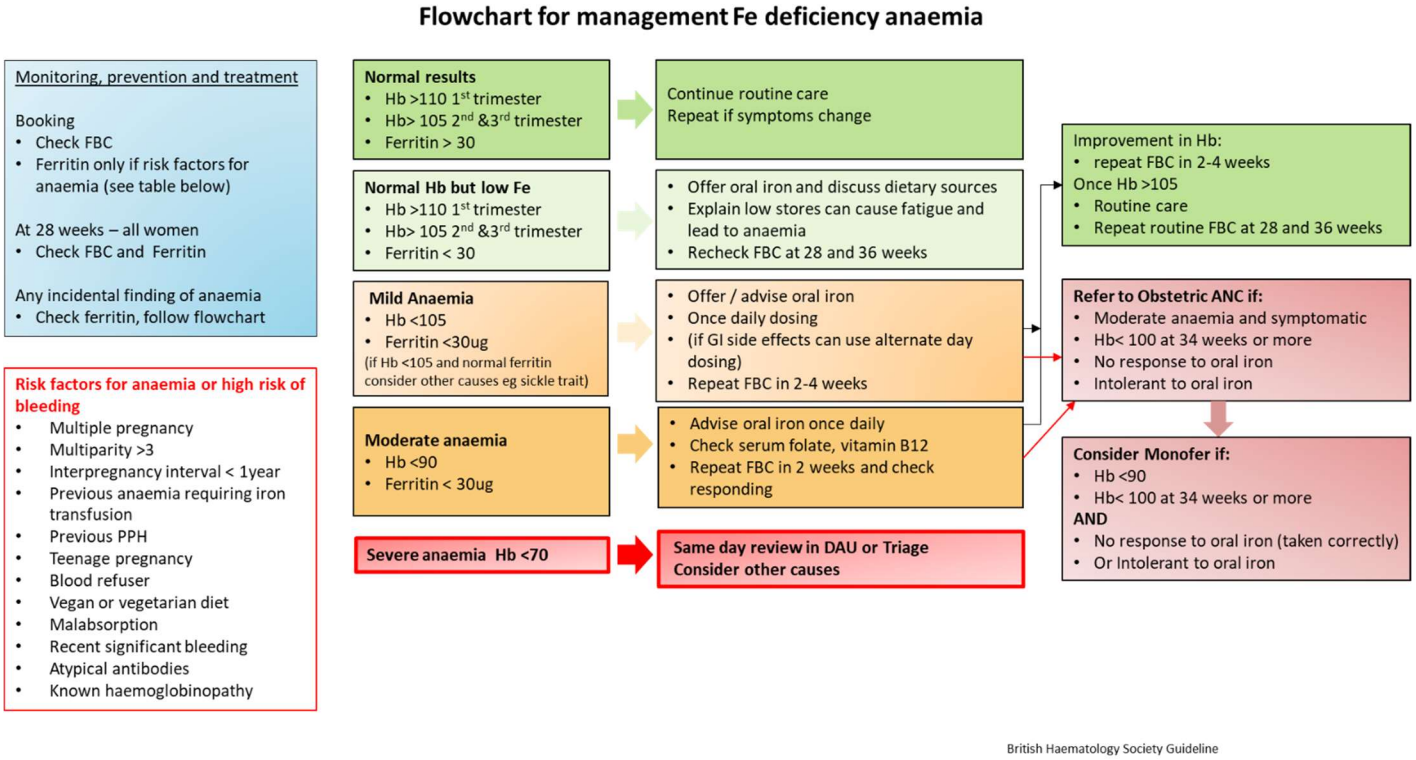
Comments on this document to: Perinatal Governance Guideline Group

Contents

Abbreviations

ANC	Antenatal Clinic
B12	Vitamin B12
DAU	Day assessment unit
FBC	Full blood count
Fe	Iron
Hb	Haemoglobin
IDA	Iron deficiency anaemia
LW	Labour ward
PPH	Post partum haemorrhage

Flowchart for Management of Iron Deficiency Anaemia



British Haematology Society Guideline

Iron Deficiency Anaemia in Pregnancy

Iron deficiency anaemia (IDA) in pregnancy is common and associated with increased risk of maternal and perinatal morbidity and mortality.

1.0 Definition:

According to The British Committee for Standards in Haematology (BCSH) (2019) defines anaemia in can be defined accordingly:

First trimester	Hb <110g/l
Second and third trimester	Hb < 105g/l
Postpartum	Hb <100g/l

2.0 Implications on maternal health

Maternal anaemia contributes to poor health outcomes through the pregnancy, childbirth and the puerperium.

The major symptoms include fatigue, headaches, palpitations, dyspnoea, irritability, poor concentration, hair loss, restless legs and Pica which is craving for non-food items such as ice (pagophagia) and soil (geophagia), may develop.

Women with anaemia are at risk of antepartum and postpartum haemorrhage. They have increased susceptibility to infections, puerperal sepsis, poor wound healing of perineal and caesarean sections wound with poor establishment of lactation and postnatal depression.

3.0 Implication on fetal and infant health

Iron deficiency anaemia in the mother leads to poor nutrient levels increasing risk of small for gestational age in the foetus and low birth weight babies. There is also increased risk of preterm birth and low APGAR scores at birth (<5 at 1 minute), stillbirth and perinatal death. It also affects the future neuro development of the infant leading to impaired motor, cognition and language development.

4.0 Detection of anaemia

4.1 Routine Antenatal care and referral to ANC

Full blood count (FBC) should be done at booking for all mothers. *At 28weeks, FBC and serum ferritin should be done. Oral iron should be commenced if Hb<105g/l and or ferritin <30mcg/l.

If anaemia - repeat FBC 2-4 weeks after commencing oral iron to assess compliance and response to oral iron. If there is an increase in the Haemoglobin to the normal range (>105g/l) she should continue oral iron until at least 6 weeks postpartum to replenish iron stores (if detected postpartum advise a 2-3 month course).

Women with no increase in Hb after 2-4 weeks

- Discuss and check compliance with oral treatment
- Check serum folate and vitamin B12 done and refer to the consultant ANC.

If Hb is normal but there is an isolated low ferritin, signpost women to dietary advise and discuss / offer over the counter Fe containing supplements. Recheck the FBC at 28 and 36 weeks to allow detection and management of anaemia prior to birth.

Vitamins, minerals and supplements in pregnancy - NHS (www.nhs.uk) provides dietary advise.

Refer to consultant ANC if:

- Moderate anaemia of Hb 90g/l and symptomatic
- Hb of 100g/l or less at >34 weeks gestation
- The woman is intolerant of oral iron or no response to oral iron after 2-4 weeks

Refer women for urgent review at DAU or triage

- Severe anaemia < 70g/l

4.2 Women at increased risk of anaemia

At booking, FBC and serum ferritin should only be done at booking for mothers at increased risk of anaemia.

Treatment of anaemia in the high-risk group should only be commenced at booking if Hb < 110g/l and /or Serum ferritin < 30mcg/l.

*An individualized approach is recommended in high risk patients with a normal serum ferritin as this does not exclude iron deficiency anaemia. Serum ferritin can be increased by recent infections and physiologic rise in acute phase proteins hence

**Prophylactic oral iron in this high-risk group should be considered and should only be commenced after discussion with a consultant or registrar.

Women at increased risk (see flowchart)
• **Multiple pregnancy**
• **Multiparity >3**
• **Interpregnancy interval < 1year**
• **Teenage pregnancy**
• **Previous anaemia requiring iron transfusion**
• **Previous PPH**
• **Vegan or vegetarian diet**
• **Malabsorption**
• **Recent history of clinically significant bleeding**
• **Atypical antibodies**
• **Known haemoglobinopathy**
Non anaemic women where estimation of iron stores are necessary • **Jehovah witness or blood refuser** • **High risk of bleeding (placenta praevia, placenta accreta)**

5.0 Treatment of anaemia

- Oral iron can be given as ferrous sulphate 200mg or ferrous fumarate 210mg once a day

- Oral iron should be taken early in the morning on an empty stomach and an hour before meals with a source of vitamin C like orange juice to maximise absorption. Ingestion of tea, coffee and antacids should be avoided at the time of taking the medication to improve absorption
- For women with gastrointestinal side effects like nausea and epigastric pain, oral iron can be taken on alternate days to improve compliance

*Oral iron should be also be offered to high risk groups and non-anaemic women at risk of anaemia if serum ferritin <30 mcg/l.

Iron infusion should be considered if:

- Moderate anaemia of Hb 90g/l
- Hb of ≤100g/l at 34weeks gestation
- **AND** intolerant of oral iron or do not respond to oral iron (at least 2 weeks correctly taken)

Occasionally it may be appropriate to arrange iron infusion for high risk cases where there is insufficient time to allow a response to oral treatment (Consultant decision)

Dosage should be calculated as appropriate (refer to monofer infusion –section)

Women identified with Hb <100g/l and approaching birth should have an individualised birth plan documented clearly in the notes.

6.0 Parenteral iron treatment (MonoFer)

A trial of oral iron (2 weeks) should be tried in the first instance. If there has been no response to oral iron or unable to tolerate then IV iron infusion is reasonable when the Hb is less than 90 (<100 at 34 weeks onwards).

This decision should be made at registrar level or above.

Iron deficiency should be confirmed with a low Hb and or low ferritin level.

If iron deficiency has shown no improvement after 2 week treatment of oral iron then B12 and folate should be arranged before treatment with MonoFer and these should be replaced if low. If these are not replaced when they are low the bone marrow can go into suppression and thrombocytopenia can occur.

A consent form (Consent form 4) must be completed documenting the risks of MonoFer infusion and the patient information leaflet provided to the patient.

The specific risks to MonoFer that should be documented on the consent form are:

- 10% risk of extravasation (where the iron infusion can leak out into the skin and cause permanent skin staining)
- Hypersensitivity reactions or anaphylaxis
- Delayed reactions
- Infection at cannula site
- Local discomfort at site of infusion

6.1 Contra-indications to MonoFer

- 1st trimester of pregnancy
- Anaemia not attributable to iron deficiency.
- Iron overload or disturbances in utilisation of iron (e.g. haemachromatosis, haemosiderosis).
- History of hypersensitivity to parenteral iron preparations

6.2 Cautions to MonoFer: only prescribe after discussion with a Consultant Haematologist and/or Consultant Obstetrician

- Patients with a history of severe asthma, or other severe atopic allergy
- Clinical or biochemical evidence of liver damage.
- Acute or chronic infection.
- Patients with thalassaemia or sickle cell disease.

6.3 Hypersensitivity

Parenterally administered iron preparations can cause hypersensitivity reactions including serious and potentially fatal anaphylactic/ anaphylactoid reactions.

Hypersensitivity reactions have been reported after previously uneventful doses of parenteral iron.

Therefore each patient should be observed for adverse effects for at least 30 minutes following each MonoFer infusion.

Hypotensive episodes may occur if intravenous injection is administered too rapidly.

MonoFer does not require a test dose.

- Acute, severe anaphylactoid reactions may occur with MonoFer although they are uncommon. They usually occur within the first few minutes of administration and are generally characterised by the sudden onset of respiratory difficulty and / or cardiovascular collapse; fatalities have been reported.
- In the event of an exceptionally rare serious anaphylactic or very severe allergic reaction, **administration of MonoFer should be stopped** and urgent help requested via 2222. The 'anaphylactic shock treatment pack' should be obtained from the Antenatal clinic drug cupboard.
- Other less severe manifestations of immediate hypersensitivity are also uncommon and include urticaria, rashes, itching, nausea and shivering.
- Administration must be stopped immediately if signs of any reaction are observed.
- Chlorphenamine 10mg slowly IV followed by 100mg IV hydrocortisone should be given and review by a doctor. The infusion can then be restarted at a slower rate and the woman observed closely, but this should only occur after transfer to the labour ward
- Mild reactions such as nausea or feeling a bit faint should warrant observation only, if they continue slow the infusion by halving the infusion rate (eg. decrease the rate from 200 ml/hr to 100 ml/hr).
- Local reactions may cause pain and inflammation at or near injection site and a local phlebitic reaction. These can be treated with simple analegesics –paracetamol and ibuprofen and slowing the rate of the infusion down e.g. decrease the rate from 200 ml/hr to 100 ml/hr.
- Delayed reactions may also occur and can be severe. They are characterised by arthralgia, myalgia and sometimes fever. The time of onset varies from several hours up to four days after administration. Symptoms usually last two to four days and settle spontaneously or with the use of simple analgesics.

6.4 Other Effects of parenteral iron

- Parenteral iron may cause falsely elevated values of serum bilirubin and falsely decreased values of serum calcium.

- MonoFer should not be administered concomitantly with oral iron preparations.
- **There is an approximate 10% risk of an extravasation injury (where the iron has leaked into the skin) with MonoFer. This will cause permanent staining of the skin to the patient. The patient must be informed of this risk before the infusion is commenced.**

6.5 Dose calculation of MonoFer

- Use 130 g/L as the target Hb
- Calculate the 'Target Hb increase' = Target Hb – Actual Hb (i.e. 130 – Actual Hb)
- Using the chart below calculate the required MonoFer dose using the woman's booking weight.
- If the woman's booking weight is < 45 kg or > 100Kg please e-mail Medicines information (based at Frimley Park Hospital (Medicines.Information@fhft.nhs.uk) who will calculate the required dose for you. Remember they will need to know the woman's details, including her current gestation, booking weight and height. They will also need to know the target Hb and actual Hb.

Body Weight (kg)	Monofer dose (mg)							
	Dose needed to replenish iron stores	Total iron need, given a target Hb increase of:						
		+10 g/l	+20 g/l	+30 g/l	+40 g/l	+50 g/l	+60 g/l	+70 g/l
45 – 50	500	600	700	900	1000	1100	1200	1300
51 – 55	600	700	800		1100	1200	1300	1500
56 – 60			900	1000	1200	1300	1500	1600
61 – 65	700	800	1000	1100	1300	1400	1600	1700
66 – 70		900		1200	1400	1500	1700	1900
71 – 75	800		1100	1300	1500	1700	1800	2000
76 – 80		1000	1200	1400	1600	1800	2000	2100
81 – 85	900	1100	1300	1500	1700	1900	2100	2300
86 – 90					1800	2000	2200	2400
91 – 95	1000	1200	1400	1600	1900	2100	2300	2500
96 – 100			1500	1700	2000	2200	2400	2700

6.6 Administering parenteral iron

This could be done either in DAU or on LW/triage

Indication, consent and Hb/Ferritin level should be documented on BadgerNet

The dose determined should be prescribed on a drug chart and sent to pharmacy (see section 6.6 how to calculate dose)

Calculate the maximum dose of MonoFer that this woman can have in a single infusion (20mg x booking weight) and record this on BadgerNet.

If the prescribed infusion would exceed the maximum dose of iron allowed in a single infusion the MonoFer must be re-prescribed and should be given as 2 separate infusions one week apart.

1. Explain the procedure to the patient and complete the pre-printed consent form
2. MonoFer should be administered by a midwife who has her/his competency for intravenous drug administration, and is able to cannulate
3. Record baseline observations: temperature, pulse, respiration rate & blood pressure. All observations should be recorded on BadgerNet
4. **Cannulate (no bloods required) and flush the cannula with a 100ml bag of 0.9% normal saline, prior to the infusion of MonoFer**
5. Aseptically add the required dose of MonoFer to 100ml of 0.9% sodium chloride and label the bag with a yellow infusion label
6. If the MonoFer dose is in the red area on the dosing chart run the infusion at 200ml/hr (infusion over 30 minutes). If the MonoFer dose is in the grey area on the dosing chart run the infusion at 100 ml/hr (infusion over 60 minutes)
7. Record the woman's pulse, blood pressure, temperature and respiratory rate every 15 minutes until 30 minutes after completion of the MonoFer infusion. All observations must be documented on BadgerNet. Fetal monitoring is not required
8. Flush the cannula with 5ml 0.9% sodium chloride prior to removal.
9. When the woman has completed all her observations the used drug chart should be filed in her hospital notes and the woman discharged

6.7 Post MonoFer infusion

- The woman should continue her previous antenatal care schedule
- Check FBC 6 weeks after the MonoFer infusion (4 weeks if the infusion has been given close to term).

- If the Hb and MCV have not improved then the woman will need her Ferritin, B_{12} & serum folate levels checked. She should then be reviewed in a consultant obstetric clinic AND further investigation and management must be discussed with a consultant haematologist.
- If the MonoFer infusion has occurred very close to term, or in the post-natal period, do not check the FBC, but ask the GP to check this when he/she sees the woman for her post-natal check.
- Do not prescribe oral iron for women who have had a MonoFer infusion in the last 12 weeks.
- If a woman has had a MonoFer infusion in early pregnancy and then has a post-natal anaemia, consider a further MonoFer infusion to treat this

7.0 Management of anaemia in labour

- Anaemic women require additional precautions for delivery
- They should be advised to deliver on labour ward as they have a high risk of PPH. Use the PPH risk assessment on BadgerNet
- Women with Hb <100g/dl should be delivered on the labour ward
    - IV access should be sited, group sent and arrange a cross match 2 units blood
    - Active management of the third stage of labour, including oxytocin/syntometrine injection to deliver the placenta and a 40unit infusion of oxytocin.

8.0 Management of anaemia postnatally

Women who had uncorrected anaemia antenatally or blood loss >500mls or symptoms suggestive of postpartum anaemia should have haemoglobin checked within 24 hours of birth.

In women whose Hb <100g/dl who are haemodynamically stable, oral iron should be offered for at least 2-3 months and followed up with their GP.

*If the Hb <70g/dl, consider blood transfusion however the decision to transfuse should be based on careful evaluation, whether or not there is risk of bleeding, cardiac compromise or symptoms requiring urgent attention, considering oral or parenteral iron therapy as alternatives.

References

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