South West Regional Transfusion Committee.
Regional template / guideline for the management of anaemia in pregnancy and postnatally.

Introduction:
Anaemia is the most common medical disorder in pregnancy. Pregnancy causes 2-3 fold increase in requirement of iron and 10-20 fold increase in folate requirement.

In iron deficiency anaemia, there is a shortage of iron stores (low ferritin), reduced transport and functional iron (low transferrin) limiting red cell production (low Hb).

In pregnant women who are anaemic in the UK, 90% of them are iron deficient. Iron deficiency causes maternal morbidity due to increased susceptibility to infections, physical weakness, preterm labour, increased risk of post partum haemorrhage, low birth weight babies and post natal depression. Maternal iron depletion also increases the risk of iron deficiency in the neonate. Managing anaemia in pregnancy will therefore help to prevent adverse fetal and maternal outcomes as well as reduce the need for allogeneic red blood cell transfusion.

Definition:
Anaemia is defined as Hb value less than 2 standard deviations below the mean value for a healthy matched population.
The definition of anaemia in pregnancy is Hb levels of:
<110g/l in the first trimester
<105 g/l in the second and third trimesters
<100 g/l in the postpartum period.
(British Committee for Standards in Haematology 2011)

Clinical Signs and Symptoms:
Pregnancy anaemia can be asymptomatic and may be diagnosed following routine screening. The signs and symptoms are often non-specific with tiredness being the most common. Women may also complain of weakness, headaches, palpitations, dizziness, dyspnoea and hair loss.

Signs of anaemia **can** occur in the absence of a low Hb. In this instance it would be diagnosed by a full blood count with a reduced MCV (Mean Cell Volume) and MCHC (Mean Corpuscular Haemaglobin Concentration). In these patients, a ferritin needs to be checked and if it is <30µ/l iron therapy should be commenced.

Diagnosis:
A trial of oral iron therapy can be both diagnostic and therapeutic. If haemaglobinopathy status is unknown, then it is reasonable to start oral iron therapy whilst screening is carried out. A trial of oral iron should demonstrate a rise in Hb within 2 to 3 weeks. If there is a rise then this confirms the

diagnosis of iron deficiency. If there is no rise, further tests must be carried out.
In patients with a known haemaglobinopathy serum ferritin should be checked first.

Ferritin levels below 30µ/l should prompt treatment and levels below 15µ/l are diagnostic of established iron deficiency.

Management:
NICE guidelines recommend that women are screened for anaemia at booking and again at 28 weeks gestation.
All women should be given advice regarding diet in pregnancy with details of foods rich in iron along with factors that may promote or inhibit the absorption of iron. This should be backed up with written information. Dietary changes alone are not sufficient to correct an existing iron deficiency in pregnancy and iron supplements are necessary.

Antenatal

If at booking Hb <110 g/l : Start on a trial of oral iron.
The necessary dose is 100-200mg of elemental iron daily.

Dose and elemental iron content per tablet.

Preparation	Dose per tablet	Elemental Iron	No of tablets per day
Pregaday		100mg	2
Ferrous Sulphate	200mg	65mg	3
Ferrous Gluconate	300mg	35mg	6
Ferrous Fumarate	210mg	68mg	3

Women should be counselled as to how to take oral iron supplementation correctly. This should be on an empty stomach, 1 hour before meals, with a source of vitamin C to maximise absorption. Other medications or antacids, tea or coffee should **not** be taken at the same time.

Women with a norman Hb but a low MCV should have their ferritin checked and if ferritin is <30µ/l, oral iron should be commenced.

Repeat Hb levels 3 weeks after commencement of iron therapy (this should fit in with 15-16 week antenatal appointment) and a rise in Hb should be demonstrated. If there is no rise in Hb despite compliance with therapy serum ferritin should be checked and concomitant causes of the anaemia need to be excluded. Referral to consultant obstetrician is required.

If at Booking Hb <90 g/l Oral iron - 200mg elemental iron in divided doses/day should be commenced and follow up as above. Referral to consultant obstetrician if symptomatic.

If at Booking Hb <70g/l send an urgent referral to joint obstetric/haematology clinic to investigate further and make management plan. Do not offer blood transfusion unless symptomatic or currently actively bleeding. *Consider* total dose IV iron infusion (See later)

200mg of elemental iron / day (N.B. if 200mg ferrous sulphate used, need 3-4 tablets/day) if taken correctly will give a rise in Hb of 20g/l every 3 weeks.

Once Hb is within the normal range, treatment should be continued for a further 3 months.

At 28 weeks.
All women should have their Hb re-checked (NICE 2008)

If at 28 weeks Hb < 105g/l Trial of oral iron as above. Re-check Hb in 3 weeks. If no reponse, check serum ferritin and refer to consultant obstetrician to consider total dose iron infusion.

If at 28 weeks Hb <90g/l Start oral iron - 200mg elemental iron in divided doses/day, as above. Consultant Obstetrician referral if symptomatic.

If at 28 weeks Hb <70g/l Urgent referral to joint obstetric/haematology clinic to investigate and make management plan. Do not offer blood transfusion unless symptomatic or currently actively bleeding. Consider total dose IV iron infusion. (See later)

NB Gastrointestinal toxicity affects 35-59% of patients and can result in non adherence to treatment with oral preparations (Auerbach and Ballard 2010) These effects can be reduced by taking oral iron with food or taking a reduced dose.

Parenteral iron can be considered from the second trimester onwards and during the third trimester for women with confirmed iron deficiency who fail to respond to or are intolerant of oral iron. Intravenous iron is the appropriate treatment for those patients with active inflammatory bowel disease where oral preparations are not tolerated or contra-indicated.

Management of Labour and Delivery

With effective management of anaemia antenatally, anaemia at delivery is usually avoided. If this occurs, all measures must be taken to avoid blood loss at delivery:

- Deliver in consultant unit
- IV access and Group and screen on admission
- Active management of third stage of labour
- In the event of a PPH prompt active management is required to stop bleeding.

- Consider the use of prophylactic syntocinon infusion.
- Postnatal FBC and serum ferritin on day 1 and iron replacement as below.

Postnatal

Hb <100g/l in postnatal period.

Haemoglobin measurement is not required following an uncomplicated, normal birth

Check FBC and serum ferritin on day 1 post delivery in the following cases:
PPH of >500mls
Uncorrected antenatal anaemia
Known iron deficiency anaemia
Any woman with signs or symptoms of anaemia

Clinical assessment alongside Hb concentration is necessary postpartum to make a decision on the best method of iron replacement. In fit, healthy asymptomatic women there is little evidence to support blood transfusion.

Hb 80-100g/l If asymptomatic and haemodynamically stable, offer 200mg elemental iron per day for 3 months. FBC and ferritin should be checked after 3 weeks to ensure that Hb and iron stores are replete.

Hb<80g/l Consider total dose intravenous iron. Repeat FBC and ferritin at 10 days to ensure response and at 3 months in community to ensure Hb and iron stores are repelete.

Hb<70g/l Consider and discuss alternatives with the woman . Consider transfusion and/or total dose IV iron.

Minimum transfusion volumes should be considered; Review after 1 unit.

Women who are symptomatic of anaemia, haemodynamically unstable or continuing to bleed heavily will need a full senior obstetric review to investigate the origin of the blood loss and decide further treatment.

Contraindications to IV iron therapy.

- First trimester of pregnancy
- Previous hypersensitivity to IV iron
- Anaemia not attributable to iron deficiency
- Iron Overload
- Acute infection/inflammation
- Clinical or biomedical evidence of liver damage
- Asthma

- Acute renal failure
- Active Rheumatoid Arthritis

References

Auerbach M, Ballard H (2010) Clinical Use of Intravenous Iron: Administration, Efficacy and Safety. **Hematology. American Society of Hematology Education Programme.** 2010;2010:p338-347.

British Committee for Standards in Haematology (2011) **UK Guidelines on the Management of Iron Deficiency in Pregnancy.** BCSH. London.

NICE (2008) **Clinical Guideline 62** Antenatal Care: Routine Care for the Healthy Pregnant Woman. NICE. London.