ANAEMIA IN PREGNANCY GUIDELINE

1. OPTIMAL OUTCOMES
   • Appropriate assessment and management of anaemia to prevent fetal and maternal morbidity and mortality

2. PATIENT
   • Pregnant woman with Hb ≤ 110g/L prior to 20 weeks
   • Pregnant woman with Hb ≤ 105g/L after 20 weeks

3. STAFF
   • Medical staff
   • Registered midwife

4. EQUIPMENT
   • 21G needle with vacutainer
   • EDTA blood tube (FBC, B12, red cell folate, HbEPG)
   • Lithium heparin with gel separation blood tube (iron studies)

5. CLINICAL PRACTICE
   • Review full blood count (FBC) at booking visit and at 28 weeks
   • Discuss appropriate diet to maintain iron stores and inform woman of symptoms of anaemia
   • Offer woman at high risk of haemoglobinopathy (eg 1. ethnic background: Southern European, Middle East, Asia, Indian subcontinent, black African: 2. low MCV or MCH) or with a known haemoglobinopathy:
     o Screening with HbEPG
     o partner testing
     o counselling
   • as early as possible regardless of haemoglobin
   • Investigate anaemia:
     o Review blood film (microcytosis, fragmentation, sickle cells) and MCV, MCH
     o Iron studies/vitamin B12/folic acid/red cell folate
     o Perform haemoglobin electrophoresis (HbEPG)
     o Perform partner screening if mother a carrier
     o Refer all women with a haemoglobinopathy to an obstetrician as soon as possible
     o Offer CVS or amniocentesis if both parents carriers
   • Recommend oral iron supplementation for women with mild iron deficiency anaemia (Hb 90-105g/L) or iron deficiency (without anaemia yet). Do not commence iron replacement without confirming iron deficiency on iron studies (because low MCV or Hb may actually be due to haemoglobinopathy)
   • Discuss side effects
   • Treat folic acid deficiency anaemia with iron and folate replacement (folic acid should be taken up to 12 weeks of gestation regardless of folic acid level to prevent neural tube defects)
   • Refer woman with moderate to severe anaemia (Hb <90g/L) to obstetrician, physician or haematologist
   • Infusion of iron may be indicated in women who are resistant to oral iron replacement
   • Refer all cases of sickle cell anaemia to the medical disorders in pregnancy clinic

6. HAZARDS/SUB-OPTIMAL OUTCOMES
   • Maternal fatigue, difficulty breathing, palpitations, reduced resistance to infections
   • Maternal risk of PPH and requirement for blood transfusion
   • Fetal morbidity and mortality associated with premature labour and low birth weight
   • Side effects of oral iron supplementation
   • Failure to diagnose haemoglobinopathy

7. DOCUMENTATION
   • Antenatal hospital record and yellow card
   • Integrated notes

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8. EDUCATIONAL NOTES

- Maternal plasma volume increases by up to 50% and red cell mass increases by 20% thereby dropping haemoglobin concentration and creating a physiological anaemia.
- Maternal iron requirements increase due to the fetus, placenta and increases in red cell mass through pregnancy. Australian recommended daily intake during pregnancy is 27mgs of elemental iron per day.
- Normal MCHC should be >27p/L and MCV >85p/L
- There is a strong association between severe anaemia (Hb <70g/L) and maternal mortality but not for mild or moderate anaemia
- Some studies have demonstrated that maternal anaemia is associated with increased risk of preterm delivery, low birth weight, IUGR and perinatal mortality but there is paucity of good evidence
- Iron deficiency is the most common cause of anaemia:
  - Characterised by low Hb/MCV/MCHC (hypochromic microcytic) and low levels of ferritin (<30microg/L) at booking and serum iron
  - In women with mild anaemia the potential benefits of iron supplements do not necessarily outweigh the adverse effects of treatment, such as gastrointestinal upset (nausea, vomiting, constipation, cramps)
  - Oral replacement is with an iron supplement containing 30-45 mgs of elemental iron per day (or up to 100mgs if slow release), ideally combined with vitamin C. Avoid taking iron replacements with dairy products.
- Folate/Vitamin B12 deficiency is characterised by low Hb and high MCV (macrocytic)
- A haemoglobinopathy is a hereditary genetic abnormality of the Hb molecule.
- Thalassemia is an abnormality of either the alpha (4) or beta (2) globin chains which make up haemoglobin. It is an autosomal recessive disease that is more common in those with a Mediterranean or Asian background
  - Alpha thalassemia – absence of up to 3 genes causes mild anaemia. Complete absence of alpha globin is not compatible with life
  - Beta thalassemia – only 1 gene inherited causes thalassemia minor (carrier). Absence of beta globin causes severe anaemia (thalassemia major) requiring regular transfusions. If both parents are carriers then the fetus has a 1 in 4 chance of developing thalassemia major.
- Sickle cell anaemia is an autosomal recessive disease with abnormal beta chains forming HbS. There is a higher incidence in people with West African and black Carribean ancestry
  - Characterised by low Hb, normal MCV and HbS on electrophoresis
  - In low oxygen environments the sickle Hb causes the red blood cell to change shape and clump causing blockage of blood vessels. Anaemia is caused by fragmentation of abnormal red cells. A sickle cell crisis is an obstetric emergency
- When discussing iron supplementation in pregnancy, awareness of the variation in elemental iron contents in supplemental formulations is important. (Elemental iron contents: Ferrogradument 105mg, Fefol 87.5mg, PFG 80mg plus 300mcg folic acid, Clements iron capsules 12mg, Clements iron liquid 15mg/15ml, Ferro liquid 30mg/5ml, Fabfol Plus 12mg elemental iron and 0.5mg folic acid, Blackmores for Women Bioiron 5mg)

9. RELATED POLICIES/ PROCEDURES/GUIDELINES

- Antenatal shared care protocol
- Protocol for intravenous administration of venofer by infusion

10. REFERENCES

- Antenatal screening tests. RANZCOG college statement 2006.
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- Sheiner E, Levy A Yerushalmi R and Katz M. Beta-thalassemia minor during pregnancy. Obstetrics and Gynaecology 2004; 103: 1273-1277,
- NHMRC