**BLOOD TRANSFUSION IN OBSTETRICS**

**Background**

 Obstetric haemorrhage remains a major cause of maternal mortality in the UK, with substandard management identified in 80% of the cases with blood transfusion either „too little, or late‟.

 The major risk of blood transfusion, is receiving an „incorrect blood component‟.

**How can the chance of transfusion be reduced?**

**1-Optimisation of haemoglobin in the antenatal period**

**Diagnosis**

 Anaemia in pregnancy is defined as first trimester haemoglobin (Hb) less than 110 g/l, second/third trimester Hb less than 105 g/l, and postpartum Hb less than 100 g/l,

 Pregnant women should be offered screening for anaemia at booking and at 28 weeks.

 Women with multiple pregnancies should have an additional full blood count done at 20–24 weeks.

**2-Treatment and management**

 for normocytic or microcytic anaemia, a trial of oral iron should be considered as the first step and further tests should be undertaken if there is no demonstrable rise in Hb at 2 weeks and compliance has been checked.

Supplement Oral iron as first-line treatment for iron deficiency.

Parenteral iron if oral iron is not tolerated, absorbed or patient compliance is in doubt.

o Parenteral therapy offers a shorter duration and a quicker response than oral therapy.

o Iron sucrose is given in multiple doses whereas iron dextran as a single total-dose infusion.

o Recombinant human erythropoietin is used in anaemia of end-stage renal disease without any adverse maternal, or fetal effects.

o Women should receive information on improvement of dietary iron intake and factors affecting absorption of dietary iron.

 Anaemia not due to haematinic deficiency (haemoglobinopathies and bone marrow failure syndromes)should be managed by blood transfusion in close conjunction with a haematologist.

 Blood loss at delivery should be minimized by:

1. Active management of the third stage of labour

2. Women at high risk of haemorrhage should deliver in hospital.

3. Optimal management of women on anticoagulants.

**General principles of blood transfusion**

**I-Consent for blood transfusion**

 Valid consent should be obtained where possible prior to administering a blood transfusion.

 In an emergency, where it is not feasible to get consent, information on blood transfusion should be provided retrospectively.

 The reason for transfusion and a note of the consent discussion should be documented in the patient‟s case notes.

**II-Requirements for group and screen samples and cross-matching:**

 All women should have blood group and antibodies status at booking and at 28 weeks.

 Women should have a group-and-save or crossmatch sample depending on the diagnosis

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 Group and screen samples used for provision of blood in pregnancy should be less than 3 days old.

 In a woman at high risk of emergency transfusion, e.g. placenta praevia, and with no clinically significant alloantibodies, group and screen samples should be sent once a week to exclude or identify any new antibody formation and to keep blood available if necessary. Close liaison with the hospital transfusion laboratory is essential.

 For women with placenta praevia, make 2 units of crossmatched red cells in the issue fridge. These units should be replaced every week by newly crossmatched units.

 Women should have a group and screen sample taken in line with clear locally agreed protocols for provision of blood.

NICE suggested that neither a group-and-save nor crossmatch sample should be taken from healthy women with an uncomplicated history who are due to have a caesarean section.

**III-Blood product specification in pregnancy and the puerperium:**

 ABO-, rhesus D- (RhD-) and K- (Kell-) compatible red cell units should be transfused. If clinically significant red cell antibodies are present, then blood negative for the relevant antigen should be cross-matched before transfusion; close liaison with the transfusion laboratory is essential to avoid delay in transfusion in life-threatening haemorrhage.

 Cytomegalovirus- (CMV-) seronegative red cell and platelet components should be provided for elective transfusions during pregnancy.

**What are the strategies to minimise the use of banked blood?**

1. In pregnancy, autologous blood transfusion is not recommended.

There is concerns about placental insufficiency,

whether the woman will make up her Hb before delivery.

whether the collected units will be sufficient in the event of major haemorrhage.

This procedure does not prevent the major risk of blood transfusion „incorrect blood component transfused‟, or the risk of bacterial contamination.

2. Cell salvage is recommended for patients where the anticipated blood loss is great enough to induce anaemia or expected to exceed 20% of estimated blood volume.

Consent should be obtained for IOCS where possible and its use in obstetric patients should be subject to audit and monitoring.

Cell salvage should only be performed by multidisciplinary teams who develop regular experience of IOCS (intraoperative cell salvage (IOCS).

Where IOCS is used during caesarean section in RhD-negative, previously nonsensitised women and where cord blood group is confirmed as RhD positive (or unknown), a minimum dose of 1500 iu anti-D immunoglobulin should be administered following the reinfusion of salvaged red cells.

A maternal blood sample should be taken for estimation of fetomaternal haemorrhage 30–40 minutes after reinfusion in case more anti-D is indicated.

IOCS has a role in the management of patients who refuse allogenic blood transfusions.

**How can major haemorrhage be managed?**

 There should be a clear local protocol with early involvement of multydisciplinary a broach (a consultant obstetrician, anaesthetist and haematologist and the blood bank).

 The protocol should be updated annually and practised in „skills drills‟ to inform and train relevant personnel.

Massive blood loss may be defined as:

o loss of 1 blood volume within a 24-hour

o 50% blood volume loss within 3 hours

o a rate of loss of 150 ml/minute.

Normal blood volume in the adult is taken as approximately 7% of ideal body weight

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**Red cells**

 There are no firm criteria for initiating red cell transfusion. The decision to provide blood transfusion should be made on clinical and haematological grounds.

 if no history of irregular antibodies during screening, group-specific compatible blood can be provided within 10 minutes plus transport time.

 If there is irregular antibodies, blood must be crossmatched.

 In an extreme situation when blood group is unknown, O Rh D negative red cells should be given.

 Staff working in obstetric units should be aware of the location of the satellite blood fridge (where available) and should ensure that access is possible for blood collection.

**fresh frozen plasma (FFP) and cryoprecipitate**

 FFP at a dose of 12–15 ml/kg should be administered for every 6 units of red cells during major obstetric haemorrhage.

 Subsequent FFP transfusion should be guided by the results of clotting tests if they are available in a timely manner, aiming to maintain prothrombin time (PT) and activated partial thromboplastin time (APTT) ratios at less than 1.5 x normal.

 It is essential that regular full blood counts and coagulation screens (PT, APTT and fibrinogen) are performed during the bleeding episode.

 Cryoprecipitate at a standard dose of two 5-unit pools should be administered early in major obstetric haemorrhage.

 Subsequent cryoprecipitate transfusion should be guided by fibrinogen results, aiming to keep levels above 1.5 g/l.

 The FFP and cryoprecipitate should ideally be of the same group as the recipient.

 If unavailable, FFP of a different ABO group is acceptable providing that it does not have a high titre of anti-A or anti-B activity.

 No anti-D prophylaxis is required if a RhD-negative woman receives RhD-positive FFP or cryoprecipitate.

**platelets**

 should not be allowed to fall below 50 x 109/l in the acutely bleeding patient

A platelet count of 50 x 109/l may be anticipated when two blood volumes have been replaced.

 A platelet transfusion trigger of 75 x 109/l is recommended to provide a margin of safety.

 The platelets should ideally also be group compatible.

 Rh D-negative women should receive Rh D-negative platelets

o Anti-Rh D immunoglobulin (250 iu) will be needed if the platelets are Rh D positive and the recipient Rh D negative. This is not necessary with a caesarean hysterectomy.

o Anti- D is given subcutaneously to minimise bruising and haematomata.

o Transfusion of platelets through a set previously used for red cells is not recommended.

**recombinant factor VIIa**

 The use of rFVIIa may be considered as a treatment for life-threatening postpartum haemorrhage but should not substitute or delay other procedure.

 There is no evidence to support the prophylactic use of rFVIIa to reduce blood loss for c/s.

**Is there a role for fibrinogen concentrate therapy**

 Fibrinogen concentrate is not licensed in the UK for the management of acquired bleeding disorders. Thus, its use in PPH should be considered only in the context of clinical trials.

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**Is there a role for antifibrinolytics**

 For those centres not participating in clinical trials, consideration should be given to using tranexamic acid during major obstetric haemorrhage.

**How should intrapartum anaemia be managed?**

 In addition to major haemorrhage guidelines, obstetric units should have guidelines on criteria for red cell transfusion in anaemic women who are not actively bleeding.

 If the Hb is less than 70 g/l in labour or in the immediate postpartum period, the decision to transfuse should be made according to the individual‟s medical history and symptoms.

**How should the woman be managed in the postnatal period?**

 If the Hb is less than 7–8 g/dl in postnatal period, the decision to transfuse should be made on an informed individual basis.

 In fit, healthy, asymptomatic patients no need for blood transfusion.

 If unexpected severe bleeding occurred, investigations should be made for bleeding diatheses.

**How should women who refuse blood transfusion be managed?**

 Hb should be optimised prior to delivery to prevent avoidable anaemia.

 Use of pharmacological, mechanical and surgical procedures to avert the use of banked blood and blood components should be considered early.

 IOCS has a role in the management of patients who refuse allogeneic blood transfusion.

 Consent/refusal of blood and components or other transfusion-sparing techniques should be discussed and documented during the antenatal period.