South Australian Perinatal Practice Guidelines

Massive Blood Transfusion

Definition

- Massive blood loss is usually defined as the loss of one blood volume (approximately 70 to 80 mL per kg body weight in pregnancy) within a 24 hours period. Alternative definitions include either 50 % blood volume loss within 3 hours or a rate of loss of 150 mL / minute

Precautions

- Clinicians should know their hospital's management plan for massive blood transfusion
- Regular updating (through mock massive transfusion drills) is recommended

Treatment priorities

- Restoration of blood volume to maintain tissue perfusion and oxygenation
- Achieving haemostasis by:
  - Treating any source of bleeding
  - Correcting coagulopathy by the judicious use of blood component treatment
- A successful outcome requires prompt action and good communication between clinical specialities, diagnostic laboratories, blood-bank staff and the local blood centre
- Organise retrieval service as appropriate

Resuscitation

- Prolonged oligaemic shock carries a high mortality rate because of organ failure and disseminated intravascular coagulation
- Initial restoration of circulating volume is achieved by infusion of crystalloid or colloid
- Red cell transfusion is likely to be required before 30 to 40 % of blood volume is lost; the loss of over 40 % of blood volume is immediately life threatening
- Hypothermia increases the risk of disseminated intravascular coagulation and other complications. This may be prevented by pre-warming resuscitation fluids, using warm air blankets, and temperature controlled blood warmers

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Investigations

- Blood samples should be taken at the earliest for blood grouping, antibody screening and compatibility testing
- Complete blood picture (CBP), international normalised ratio (INR), activated partial thromboplastin time (APTT), fibrinogen, U & Es, creatinine, liver function test (LFT), blood gases
- Repeat CBP, INR, APTT, fibrinogen every 4 hours or after 1 / 3 blood volume replacement
- Repeat after blood component infusion
- May need to give components before results are available

Request suitable red cells

- In extreme emergency:
  - Use uncross-matched group O Rh negative
  - When blood group is known, use group specific blood
- Use fully cross-matched blood when time permits
- Use blood warmer (if flow rate > 50 mL / kg / hour) and / or rapid infusion device
- Further cross-match is not required after replacement of 1 blood volume (8 - 10 units)

Request platelets

- Anticipate platelet count < 50 x 109 per litre after 2 x blood volume replacement or sooner
- Target platelet count
  - Generally > 50
  - If central nervous system injury or known platelet defect > 100 x 109 per litre
  - Consider platelet transfusion when platelet count falls below target levels
- Transfuse through an intravenous line approved for blood administration and incorporating a clean standard (170 to 260 micron) filter. Transfusion of each unit may proceed as fast as tolerated but should be completed within four hours of commencing transfusion

Request FFP

- Dosage is 12 - 15 mL / kg body weight - 1 litre or 4 units for an adult
- Aim for INR < 1.8 and APTT < 40 seconds
- INR > 1.8 and APTT > 40 seconds correlates with increased surgical bleeding
- Allow for 30 minutes thawing time

Request cryoprecipitate

- Dosage is 1 - 1.5 donor units per 10 kg body weight
- Used to replace fibrinogen

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- Fibrinogen < 0.5 is strongly associated with microvascular bleeding
- Fibrinogen deficiency develops early when plasma-poor red blood cells are used for replacement
- Allow for 30 minutes thawing time

Fresh whole blood

- Limited indications: indicated only for women who have a symptomatic deficit in oxygen-carrying capacity combined with hypovolaemia of sufficient degree to be associated with shock

Recombinant FVIIa

- Recombinant factor VIIa (FVIIa) has been used in the management of intractable microvascular bleeding after trauma or surgery, that has not been controlled by conventional transfusion replacement treatment using red cells, platelets, fresh frozen plasma and cryoprecipitate
- The use of FVIIa may be considered when the woman's condition continues to deteriorate to imminent haemorrhagic death. Such use must be discussed by the consultant surgeon / obstetrician or trauma specialists, ICU consultant or anaesthetist involved with the laboratory haematologist and / or transfusion medical scientist
- The current recommended dose is 90 microgram / kg

Reference

1. Australian Red Cross Blood Service (ARCBS). Massive transfusion guidelines. Available at URL: http://www.donateblood.com.au/clinical
2. McClelland DBL editor. Handbook of transfusion medicine. 3rd ed. London: The Stationery; 2001.

Other useful sites

http://www.nhmrc.gov.au/publications/pdf/cp83.pdf

Version control and change history

PDS reference: OCE use only

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