Amniotic Fluid Embolism (AFE) Management

Definition
Amniotic Fluid Embolism (AFE) is a rare and catastrophic obstetric emergency in which amniotic fluid, and other debris, enters the pregnant woman’s blood stream via the placental bed of the uterus and causes an allergic reaction. The incidence of AFE is in the order of 1 in 16 000 to 1 in 55 000 pregnancies.

The clinical diagnosis is based on the presentation with cardiovascular collapse or coagulopathy in the absence of other potential explanation. Women with mild cases of AFE usually recover without sequelae, but the overall fatality rate with severe AFE is high and case fatality rates of 13% to 30% are reported in recent studies. Neurological damage may occur in some survivors. Perinatal outcome is good in infants born to women who develop AFE following delivery but the perinatal mortality rate is high (154 in 1000) if AFE develops prior to delivery.

Risk factors
Two studies from North America have reported increased rates of AFE with maternal age >35 years, caesarean section, preeclampsia, placenta previa and placental abruption. Medical induction of labour was found to be a risk factor in only one study. However, the majority of women who develop AFE have no identifiable underlying risk factors.

Signs and symptoms
AFE usually presents during labour or around delivery, although cases have also been reported in first and second trimester abortion and as late as 48 hours postpartum.

Premonitory symptoms have been described and include breathlessness, chest pain, feeling cold, light headedness, restlessness, distress, panic, nausea and vomiting, pins and needles. Pain is not usually a feature.

Early symptoms include a sudden onset of dyspnoea and hypotension which is frequently followed by cardiovascular collapse and respiratory arrest. In 10-20% of cases these events are preceded by seizure-like activity. In women who survive this initial phase, coagulopathy frequently follows. In 10-15% of patients coagulopathy is the presenting manifestation.
Clinical management

Current treatment consists of aggressive oxygenation, treatment of circulatory collapse and counteracting coagulopathy. Prompt delivery may prevent fetal asphyxia and improve fetal outcome when AFE occurs prior to delivery.

Circulatory collapse

1. Oxygen should be given at high concentrations and unconscious patients should be immediately intubated and ventilated.

2. Intravascular access should be obtained.

3. Vasopressors should be used to improve ventricular function, inotropes also have a place.

4. Other therapies include inhaled nitric oxide for pulmonary hypertension, cardiopulmonary bypass.

Coagulopathy and major obstetric haemorrhage

Development of coagulopathy and major obstetric haemorrhage should be anticipated. In the event of bleeding, a massive transfusion protocol should be activated.

1) Baseline bloods should be taken to assess the presence and degree of coagulopathy and a group and antibody screen taken to allow blood for transfusion.

Baseline bloods required:
   i) Blood for group and antibody screen/crossmatch (pink tube)
   ii) FBC in edta tube (purple top)
   iii) Coagulopathy screen in citrate tube (blue top).

2) Management of coagulopathy

Disseminated intravascular coagulation with rapid consumption of blood clotting proteins especially fibrinogen and also platelets is very common and develops very rapidly in AFE compared to other causes of major haemorrhage. Aggressive pre-emptive replacement of platelets and clotting factors with fresh frozen plasma (FFP) and cryoprecipitate (to replace fibrinogen) is recommended in addition to transfusion of red blood cells.

3) Haemorrhage should be aggressively managed with uterotonic agents, uterine tamponade and examination to exclude co-existent genital tract trauma that may exacerbate blood loss. Severe ongoing uterine bleeding that does not respond to first line measures requires rapid recourse to more invasive techniques such as bracing suture (B-Lynch suture), uterine artery ligation, peripartum hysterectomy. Recombinant FVIIa has been used in management of severe obstetric haemorrhage that is unresponsive to standard treatment. Options for second line treatment will be dependent on the expertise and resources available locally.
Prevention of AFE

While prediction and prevention of AFE is not possible based on our current understanding of this rare complication, the Perinatal and Maternal Mortality Review Committee has made two recommendations that assist in improving outcomes for patients who develop AFE.

- The Minister of Health note that all staff involved in care of pregnant women should undertake regular training in management of obstetric emergencies
- The Ministry of Health encourages each acute obstetric unit to develop a massive transfusion protocol to respond to major obstetric haemorrhage. It is possible that this be developed as a national process to support local processes.

1 Tuffnell DJ. United Kingdom Amniotic Fluid Embolism Register. BJOG. 2005 Dec; 112: 1625 – 1629.


