

Key notes on: Amniotic Fluid Embolism

- Amniotic fluid embolism is a very rare complication of childbirth – it is sometimes referred to as ‘anaphylactoid syndrome of pregnancy’
- Complex series of events, triggered by a disruption of the maternal/fetal interface with potential passage of amniotic fluid to maternal circulation, resulting in abnormal activation of proinflammatory mediators and procoagulant factors
- Typically occurs during labour, birth or early postpartum, though can occur at any time during pregnancy
- No diagnostic test – remains a clinical diagnosis
- Premonitory symptoms common – breathlessness, chest pain, restless & agitated, nausea, a ‘sense of doom’
- Clinical presentation usually: sudden cardiovascular collapse, hypotension, cyanosis, acute fetal distress, haemorrhage, and many women also have a seizure
- **Two cardiac phases:** pulmonary hypertension and right heart failure, followed by left heart failure;
Respiratory: hypoxia; acute **coagulopathy (DIC)**
- Management is supportive – maintain oxygenation and circulation; i.e. ventilation, inotropes, ECMO, coagulation correction
- About 40-80% require CPR; overall mortality rate 15-30% in high resource countries

Key resources/recommended reading

Stafford IA, Moaddab A, Dildy GA, Klassen M, Belfort MA, Romero R, Clark SL. Evaluation of proposed criteria for research reporting of amniotic fluid embolism. *American Journal of Obstetrics & Gynecology*. 2019;220(3):285-7.

Acker LC, Jones RC, Rasouli MR, Bronshteyn YS. Focused Cardiac Ultrasound during Amniotic Fluid Embolism. *Anesthesiology: The Journal of the American Society of Anesthesiologists*. 2019;130(6):1032-3.

Clark SL. Amniotic Fluid Embolism. *Obstetrics and Gynecology*. 2014;123(2, Part 1):337-48.

McDonnell N, Knight M, Peek MJ, Ellwood D, Homer CS, McLintock C, et al. Amniotic fluid embolism: an Australian-New Zealand population-based study. *BMC Pregnancy and Childbirth*. 2015;15(1):1.

Knight M, Tuffnell D, Brocklehurst P, Spark P, Kurinczuk J, on behalf of the UK Obstetric Surveillance System. Incidence and Risk Factors for Amniotic-Fluid Embolism. *Obstet Gynecol*. 2010;115(5):910-7.

Legrand M, Rossignol M, Dreux S, Luton D, Ventré C, Barranger E, et al. Diagnostic accuracy of insulin-like growth factor binding protein-1 for amniotic fluid embolism. *Critical Care Medicine*. 2012;40(7):2059-63.

Indraccolo U, Ventrone R, Scutiero G, Greco P, Indraccolo S. Interventions for treating amniotic fluid embolism: a systematic review with meta-analysis. *Clin Exp Obstet Gynecol*. 2017:666-677.

Abenhaim HA, Azoulay L, Kramer MS, Leduc L. Incidence and risk factors of amniotic fluid embolisms: a population-based study on 3 million births in the United States. *American Journal of Obstetrics and Gynecology*. 2008;199:49.e1-.e8.

Kramer MS, Rouleau J, Liu S, Bartholomew S, Joseph KS, for the Maternal Health Study Group of the Canadian Perinatal Surveillance System. Amniotic fluid embolism: incidence, risk factors, and impact on perinatal outcome. *BJOG: An International Journal of Obstetrics & Gynaecology*. 2012;119(7):874-9.

McDonnell NJ, Percival V, Paech MJ. Amniotic fluid embolism: a leading cause of maternal death yet still a medical conundrum. *International Journal of Obstetric Anesthesia*. 2013;22(4):329-36.

Pacheco LD, Saade G, Hankins GDV, Clark SL. Amniotic fluid embolism: diagnosis and management. SMFM Clinical Guidelines Number 9. *American Journal of Obstetrics and Gynecology*. 2016;215(2):B16-B24.

Tuffnell DJ, Slemeck E. Amniotic fluid embolism. *Obstetrics, Gynaecology and Reproductive Medicine*. 2017 Mar 1;27(3):86-90.

Conde-Agudelo A, Romero R. Amniotic fluid embolism: an evidence-based review. *Am J Obstet Gynecol* 2009;201:445.e1-13.

Fitzpatrick K, Tuffnell D, Kurinczuk J, Knight M. Incidence, risk factors, management and outcomes of amniotic-fluid embolism: a population-based cohort and nested case-control study. *BJOG: An International Journal of Obstetrics & Gynaecology*. 2016;123(1):100-9.

Fong A, Chau CT, Pan D, Ogunyemi DA. Amniotic fluid embolism: antepartum, intrapartum and demographic factors. *The Journal of Maternal-Fetal & Neonatal Medicine*. 2015;28(7):793-8.

Indraccolo U, Battistoni C, Mastrantonio I, Di Iorio R, Greco P, Indraccolo SR. Risk factors for fatality in amniotic fluid embolism: a systematic review and analysis of a data pool. *The Journal of Maternal-Fetal & Neonatal Medicine*. 2018 Mar 4;31(5):661-5.

Bonnet MP, Zlotnik D, Saucedo M, Chassard D, Bouvier-Colle MH, Deneux-Tharaux C. Maternal death due to amniotic fluid embolism: a national study in France. *Anesthesia & Analgesia*. 2018 Jan 1;126(1):175-82.

Papers with a disseminated intravascular coagulopathy (DIC) focus

Martí-Carvajal AJ, Comunián-Carrasco G, Peña-Martí GE. Haematological interventions for treating disseminated intravascular coagulation during pregnancy and postpartum. *Cochrane Database of Systematic Reviews* 2011, Issue 3. Art. No.: CD008577. DOI: 10.1002/14651858.CD008577.pub2.

Erez O, Novack L, Beer-Weisel R, Dukler D, Press F, et al. DIC Score in Pregnant Women – A Population Based Modification of the International Society on Thrombosis and Hemostasis Score. *PLoS ONE* 2014;9(4): e93240. doi:10.1371/journal.pone.0093240

Murphy N, Broadhurst DI, Khashan AS, Gilligan O, Kenny LC, O'Donoghue K. Gestation-specific D-dimer reference ranges: a cross-sectional study. *BJOG: An International Journal of Obstetrics & Gynaecology*. 2015;122(3):395-400.

Montagnana M, Franchi M, Danese E, Gotsch F, Guidi GC. Disseminated intravascular coagulation in obstetric and gynecologic disorders. *Seminars in Thrombosis and Hemostasis*. 2010;36:404–18.