Diagnosing and Treating an Amniotic Fluid Embolism: A Literature Review

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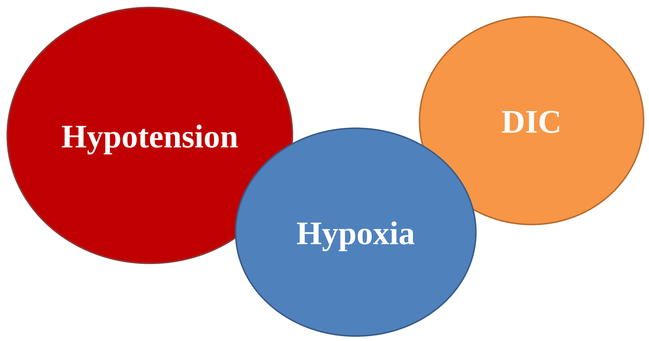
https://cdn2.momjunction.com/wp-content/uploads/2019/08/High-Amniotic-Fluid.jpg

OVERVIEW

Unpreventable--devastating--lethal

- "Amniotic fluid embolism (AFE) is the second leading cause of maternal mortality in the USA with an incidence of 1: 15,200 births" (Rezai et al., 2017).
- Incidence and diagnosis differ by region.
- Debris from the amniotic fluid mixes with maternal blood in the pulmonary circulation resulting in a devastating reaction (for some).

TRIAD OF SYMPTOMS



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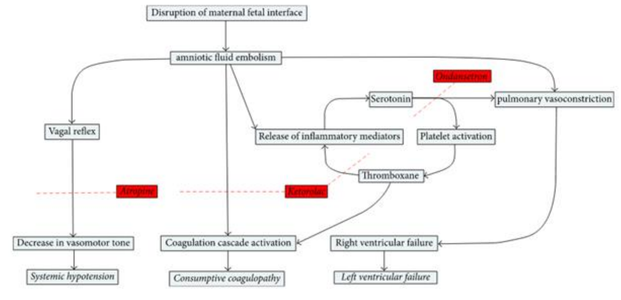
DIAGNOSIS

1. Cardiorespiratory arrest (Hypotension (SBP<90 mm Hg) and respiratory compromise (dyspnea, cyanosis, or SpO2 <90%).
2. Disseminated intravascular coagulation (DIC)
3. Onset during labor or within 30 minutes of delivery of placenta.
4. No fever (≥38.0°C) during labor.

(Clark et al.,2016)

Proposed mechanism for Atropine, Ondansetron, and Ketorolac (A-OK) protocol.



Rezai, S., Hughes, A. C., Larsen, T. B., Fuller, P. N., & Henderson, C. E. (2017). Atypical amniotic fluid embolism managed with a novel therapeutic regimen. *Case Reports in Obstetrics & Gynecology*, 1–6. https://doi.org/10.1155/2017/8458375

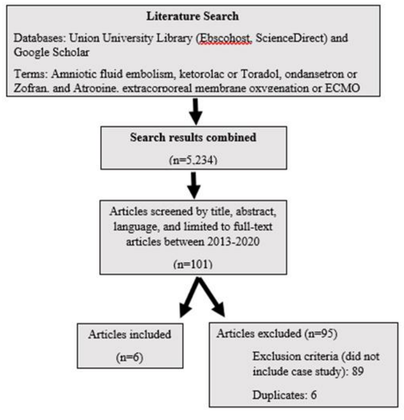
AMNIOTIC FLUID

•Endogenous mediators: "platelet activating factor, phospholipase A2, endothelin, thromboplastin and prostaglandin" (Lee et al., 2016).
•Anaphylactic reaction → pulmonary vasoconstriction

CASE STUDIES

Case Study	Age (years) & race	Gestation & type of delivery	Comorbidities	Signs/ Symptoms	Blood loss & HF	Treatment	Length of stay & Patient status
Gitman et al., 2019	42 Unknown race	Nulliparous 34 2/7 weeks C-section	-Pre-eclampsia -Uterine fibroids	-Unresponsive -Hypoxic -BP 48/25 -PEA -DIC *TRIAD	3ooo ml Right HF	A: 1mg O: 4mg T: 30mg VA ECMO Massive transfusion	25 days Normal neurologic function. Sent to rehabilitation
Kim et al., 2020	39 Unknown race	G4P2 38 weeks 2 days C-section	2 previous miscarriages	-Mental change -Seizure -Cyanosis -Fetal bradycardia *TRIAD	3000 ml Left HF	VA ECMO Massive Transfusion	>41 days (foot drop from ECMO)
Lee et al., 2016	36 Unknown race	Primigravida-twin pregnancy C-section at 30 weeks-5 days	-Vitro fertilization -Gestational hypertension and diabetes.	-Dyspnea -Cyanosis (SpO2 75-40%) -Cardiac arrest (PCO2 15-0) -DIC *TRIAD	600 ml 8min from dyspnea to arrest Left HF	VA ECMO Massive Transfusion	40 days Impaired cognitive function to nursing home
Parfitt & Roth, 2019	Unknown age and race	G3P2 Full term C-section	-	10 minutes after intrauterine catheter→ -Dyspnea -Cardiac arrest	Not enough information -DIC?	A: 1 O: 8 Sable in 5 minutes	8 days no limitations
Rezai et al., 2017	26 Hispanic	G2P1001 38 1/7 weeks gestation C-Section	-Obese -Gestational diabetes	-Dyspnea (for 8hrs) -Fever -HR 144 Diagnosed: Sepsis Post-delivery: -Cyanosis -Hypotension -Cardiac arrest	2000 ml Unknonwn	A: 0.2mg O: 8mg K: 15mg Transfusion	3 days
Wise et al., 2016	34 Unknown	Primagravida Full term 39 wk 4 days Vacuum assisted Vaginal,	-	-Hypotension - Tachycardic -DIC -Cyanosis	2500 ml RHF	-V-V ECMO -V-A ECMO Hemodialysis (HD) -Bakri balloon -Artery embolization	18 days On HD for 3 months

METHODS



LAB WORK

Modified International Society on Thrombosis and Hemostasis scoring system for overt disseminated intravascular coagulation in pregnancy

Platelet	PT/INR	Fibrinogen
>100,000/ml = 0	<25% increase = 0	>200 mg/L = 0
<100,000/ml = 1	25-50% increase = 1	<200 mg/L = 1
<50,000/ml = 2	>50% increase = 2	

Score ≥3 =DIC in pregnancy

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IMPLEMENTATION

Question: What is the satisfaction level of student registered nurse anesthetists regarding the guideline presented for the diagnosis and treatment of AFE?

- 21 people participated

Survey	Response (%)
Overall, how would you rate the course?	Excellent 95.24 Very good 4.76
How confident do you feel about applying the material covered in practice?	Extremely 33.33 Very 61.90 Somewhat 4.76
How useful were the course materials?	Extremely 90.48 Very 4.76 Somewhat 4.76
How clearly did your instructor explain the course material?	Extremely 80.95 Very 19.05

Survey	Response %
The speed with which your instructor presented the course material	Much too fast 4.76 Too fast 4.76 The right amount 90.48
How well did your instructor answer students' questions?	Extremely well 76.19 Very well 23.81
How comfortable did you feel voicing your opinions in class?	Extremely 76.49 Very 23.81
How helpful were the visual aids and PowerPoint?	Extremely 70 Very 25 Somewhat 5

CONCLUSION

- Rare emergency requiring rapid recognition and treatment
- Triad of symptoms: hypoxia, cardiovascular collapse (hypotension), and coagulopathy (DIC)
- Atypical presentations exist (seizures and frothy pink sputum).
- Both the novel A-OK regimen and the more aggressive ECMO therapy have positive patient outcomes.
- More data needs to be submitted to study the disease process further and determine the cause, treatment, risk factors, diagnostic criteria, and biomarkers.

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