Outcomes of Temporary Mechanical Circulatory Support in Peripartum Patients with Amniotic Fluid Embolisms

Fariha Hanif BS, MPH; Michael Quiñones MD, MBA; Edward Sutanto BS; Andrew Warburton MD; Talia Scott MD; Daniel Katz MD

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Mount Sinai

Background and Hypothesis

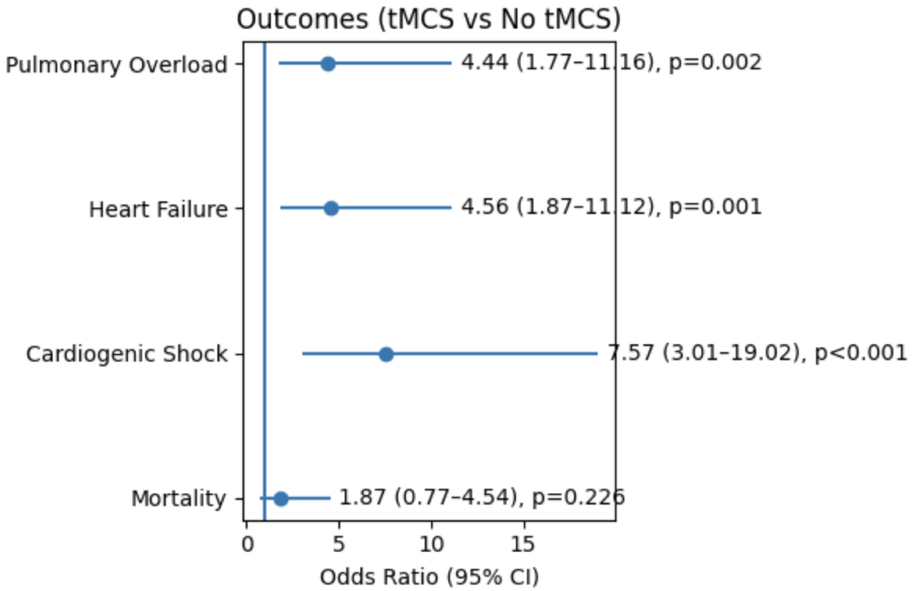
- Amniotic fluid embolism (AFE) is a rare but catastrophic OB emergency
- Mortality rates historically between 20-60%
- Amniotic fluid embolism (AFE) is characterized by:
  - Sudden cardiovascular collapse
  - Cardiogenic shock and respiratory failure
  - Disseminated intravascular coagulopathy
- Management is limited to supportive care and temporary mechanical cardiovascular support (tMCS)
  - ECMO, balloon pumps, Impellas ®
- Limited data exist on whether tMCS impacts mortality or reflects greater baseline severity
- Objective: To evaluate outcomes in peripartum patients with AFE who received tMCS compared to those who did not, using a large multicenter database
- Hypothesis: Peripartum patients with AFE who receive tMCS will have higher morbidity due to greater illness severity, but no significant difference in mortality compared to those who do not receive tMCS.

Study Design and Methods

- Retrospective cohort analysis using the TriNetX Global Collaborative Network
- Population: Peripartum patients with amniotic fluid embolism (AFE)
- Cohort stratification
  - Group 1: AFE with tMCS
    - ECMO cannulation, intra-aortic balloon pump (IABP), ventricular assist devices (Impella ®)
  - Group 2: AFE without tMCS
- Primary outcome: Mortality
- Secondary outcomes: Cardiogenic shock, heart failure, pulmonary overload
- Statistical analysis
  - Odds ratio (OR) with 95% confidence intervals
  - Kaplan-Meier survival analysis used for time-to-event outcomes

Results

- Population
  - Total: 158 patients with AFE + ACLS
    - No tMCS: 133
    - tMCS: 25
- Mortality
  - tMCS: 40.0%
  - No tMCS: 26.3%



Conclusion and Discussion

- Patients with AFE requiring tMCS had **significantly higher morbidity**
  - ↑ cardiogenic shock
  - ↑ heart failure
  - ↑ pulmonary overload
- **No statistically significant difference in mortality compared to non-tMCS patients**
- Clinical interpretation: tMCS patients might represent a more critically ill population; however, mortality was not significantly worse, suggesting that tMCS may provide effective hemodynamic rescue in severe AFE
- Implications: Supports the role of tMCS as a viable rescue therapy
- Limitations: retrospective design, small sample size, reliance on ICD coding
- Future directions
  - Larger multicenter studies to improve statistical power
  - Prospective studies examining the impact of early vs delayed initiation of tMCS on survival outcomes; examining the effectiveness of different types of tMCS
  - Development of clinical criteria/algorithms for tMCS initiation in AFE