Association of IVF with Severe Neonatal Morbidity

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OBJECTIVES

- A composite neonatal adverse outcome indicator (CNAOI) that identifies infants with significantly increased risk for hospital readmission/death in the first year of life has been validated in Australia and the UK
- We aimed to investigate the association between IVF and SNM (severe neonatal morbidity), a composite neonatal adverse outcome indicator which includes diagnoses and procedures, minimally modified from the validated CNAOI
- A secondary objective was to assess whether IVF is associated with the administration of antenatal steroids for fetal lung maturity

STUDY DESIGN

- Retrospective cohort study
- Inclusion criteria: Live singleton deliveries at ≥ 23 weeks GA at two hospitals in NY from 2019-2023
- Data collected from electronic medical records included maternal demographics, health insurance, parity, preferred language, mode of delivery, obstetric comorbidity index (OB-CMI) score, and obstetric and neonatal variables
- Inferential statistics were performed to determine if there was a significant difference in outcomes between the IVF and non-IVF cohorts
- Multivariable logistic regression analysis was used to examine the association between these groups

SNM Variables

- Any body cavity surgery
- Birthweight <1500g
- Blood transfusion
- Brachial plexus injury
- Bronchopulmonary dysplasia
- Chest tube insertion
- CPAP
- Death <28 days or before dc
- Exchange transfusion
- GA <32 weeks
- HIE
- IVH
- Mechanical ventilation
- Necrotizing enterocolitis
- Neonatal resuscitation
- Periventricular leukomalacia
- Pneumonia
- Pneumothorax
- RDS
- Retinopathy of prematurity
- Seizure
- Sepsis
- Stroke

RESULTS

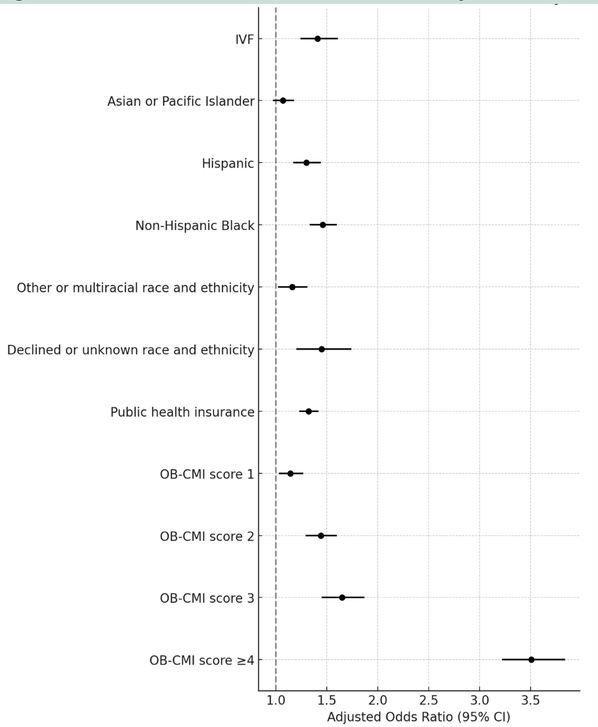
IVF was associated with higher odds of experiencing a SNM event, **OR 1.59 (95% CI, 1.40-1.80)**

Steroid administration occurred more frequently in the IVF cohort (8.54% vs. 6.38%, **p<0.0001**)

Table: Multivariable logistic regression model

Characteristics	SNM n=3,996	No SNM n=43,437	aOR Ratio (95% CI)
IVF			
Yes	296 (12.52)	2,082 (87.55)	1.41 (1.24-1.61)
No	3,700 (8.21)	41,355 (91.79)	1 (reference)
Race/ethnicity			
Asian or Pacific Islander	644 (7.29)	8,195 (92.71)	1.07 (0.97-1.18)
Hispanic	641 (9.99)	5,774 (90.01)	1.30 (1.17-1.44)
Non-Hispanic Black	915 (12.20)	6,587 (87.80)	1.46 (1.33-1.60)
Non-Hispanic White	1,304 (6.83)	17,793 (93.17)	1 (reference)
Other or multiracial	353 (8.45)	3,825 (91.55)	1.16 (1.02-1.31)
Declined or unknown	139 (9.91)	1,263 (90.09)	1.45)1.20-1.74)
Public Health Insurance			
Yes	1,443 (10.44)	12,381 (89.56)	1.32 (1.23-1.42)
No	2,553 (7.60)	31,056 (92.40)	1 (reference)
OB-CMI score			
0	1,011 (5.49)	17,403 (94.51)	1 (reference)
1	626 (6.23)	9,426 (93.77)	1.14 (1.03-1.27)
2	571 (7.96)	6,604 (92.04)	1.44 (1.29-1.60)
3	368 (9.21)	3,626 (90.79)	1.65 (1.45-1.87)
≥4	1,420 (18.21)	6,378 (81.79)	3.51 (3.22-3.84)

Figure: Odds of Severe Neonatal Morbidity



CONCLUSIONS

- Newborns conceived via IVF are about **one and a half times more likely to experience SNM**
- OB-CMI score predicts severe maternal morbidity and was also seen to be positively associated SNM, yet infants born to people with scores of ≤ 3 had lower overall odds of experiencing SNM than those conceived via IVF
- The higher rates of antenatal steroid administration seen in the IVF cohort are likely due to their higher risk of preterm delivery. Rates of SNM would likely be even higher in this cohort without antenatal steroid administration
- Future studies could review specific mechanisms underlying this elevated SNM risk to optimize antenatal surveillance and counseling for IVF-conceived pregnancies and to aid in making informed decisions

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