Prediction of Cesarean Delivery by Umbilical Artery Dopplers in Growth Restricted Fetuses

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Background and Introduction

- Characteristics that predict a cesarean delivery (CD) after induction of labor for the growth restricted fetus are not well reported in the literature
- This study aims to evaluate the relationship between fetal growth restriction (FGR), umbilical artery Doppler studies and cesarean birth

Materials & Methods

- This was a retrospective cohort study of fetuses identified with FGR (EFW <10th percentile) at a single academic medical center over 7 years
- Inclusion criteria
  - Singleton pregnancy undergoing induction of labor
  - Identified with FGR (EFW <10th percentile)
- Exclusion
  - No induction of labor
  - Prior cesarean birth
  - Multifetal gestation
- Primary outcome was mode of delivery after induction of labor
  - Abnormal umbilical artery Dopplers were defined as an S/D ratio >95th percentile for GA, or absent end diastolic flow (AEDV) or reverse end diastolic flow (REDV)
  - Maternal co-morbidities included hypertension, preexisting diabetes, or autoimmune disease
- Statistics included
  - Chi square tests, student t test, and logistic regression modeling
  - All statistical analyses were performed with significance levels of <0.05 using IBM SPSS (V24.0)

Results

- 229 women identified with FGR
  - 158 women met inclusion criteria
- Induction of labor resulted in:
  - 76% (121) of women having a vaginal birth
  - 23% (37) with a primary CD for abnormal FH tracing during labor
- Groups were similar for maternal age, smoking, oligohydramnios, preeclampsia, and maternal comorbidities
- Women delivering vaginally were more likely to be multiparous (60% v 41%; p=0.04)

Results

- Abnormal umbilical artery Doppler
  - Occurred in 29% (41) fetuses with abnormal umbilical artery Doppler
    - 15% (6) had AEDF
    - None had REDV
- Women delivering by CD had a greater incidence of abnormal umbilical Dopplers (46% vaginal v 67% CD; $p<0.01$)
- Logistic regression modeling:
  - Only an abnormal umbilical artery Doppler remained as an independent predictor for cesarean birth (OR 3.6; 95%CI 1.57-8.29; p=0.0025)

Characteristics Associated with Cesarean Birth in Women with FGR Undergoing Induction of Labor

Variable	Odds Ratio	95% CI	p value
Abnormal Dopplers	3.6	1.57-8.29	0.0025
Oligohydramnios	1.24	0.42 - 3.64	0.70
Smoking	0.84	0.22 - 3.25	0.80
Maternal comorbidities	1.23	0.52 - 2.92	0.64
Multiparity	0.46	0.21 - 1.01	0.05
Substance use	0.71	0.16 - 3.12	0.65

Conclusion

Abnormal umbilical artery Doppler is associated with an increased risk for cesarean delivery in women with fetal growth restriction

This may be useful information when counseling patients

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Thank you!

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