Increased intertwin discrepancy in cerebroplacental ratio is predictive of earlier age at delivery in monochorionic-diamniotic twins

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Background

- Monochorionic-diamniotic (MCDA) twins account for 20% of all twin pregnancies.
- MCDA twins have a 3 to 5 fold increased risk of perinatal morbidity and mortality compared to dichorionic twins due to the presence of two fetal circulations that are interconnected by a shared placenta.
- Unbalanced vascular anastomoses can result in complications specific to MCDA twins:
  1. Twin-twin transfusion syndrome (TTTS)
  2. Twin-anemia polycythemia sequence (TAPS)
  3. Selective intrauterine growth restriction (sIUGR)
- Due to the increased risk of complications, MCDA twin pregnancies require closer surveillance.
- Evidence for optimal timing and component of evaluations is limited.

Objective

To investigate the role of intertwin discrepancy in cerebroplacental ratio (CPR-\(\triangle\)) for the prediction of gestational age (GA) of delivery in monochorionic-diamniotic (MCDA) twin pregnancies.

Study Design

- Retrospective cohort study of all MCDA pregnancies followed at a single maternal fetal medicine center from January 1, 2007 to July 15, 2017

Results

- 143 MCDA twin pregnancies (16 lost to follow-up) and 249 newborns met inclusion criteria:
  - Median maternal age: 35 years (IQR 31–38)
  - Median maternal BMI: 26.1 kg/m\(^2\) (IQR 22–28.9)
- Significant correlation between maximum CPR-\(\triangle\) in second trimester and need for NICU admissions
- Logistic regression analysis showed a significant association between CPR-\(\triangle\) in the second trimester and need for NICU admissions

PREGNANCY OUTCOMES

<table>
<thead>
<tr>
<th>MCDA-specific complications</th>
<th>sIUGR (41)</th>
<th>TTTS (16)</th>
<th>TAPS (7)</th>
<th>IUFD of one twin (8)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Median gestational age at delivery</td>
<td>35 weeks and 6 days (IQR 34w0d – 36w3d)</td>
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<tr>
<td>Mode of delivery</td>
<td>Cesarean section</td>
<td>Vaginal</td>
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<td>Median birth weight</td>
<td>2,237 grams (IQR 1,925 – 2,495)</td>
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STATISTICAL ANALYSIS

- Significant correlation between maximum CPR-\(\triangle\) in second trimester to (1) GA at delivery and (2) Average birth weight.

Conclusions

- Increasing CPR-\(\triangle\) in the second trimester is correlated with earlier gestational age at delivery, lower average birth weight, and NICU admissions.
- CPR evaluation may be of clinical utility in the surveillance of MCDA twin pregnancies.

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