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-anæmia polyhydramnios 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 middle cerebral artery peak systolic velocity (MCA_{psv}) for the prediction of adverse outcomes in 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

1. 143 MCDA twin pregnancies (16 lost to follow-up) and 249 newborns met inclusion criteria
   o Median maternal age: 35 years (IQR 31 – 38)
   o Median maternal BMI: 26.1 kg/m² (IQR 22 – 28.9)

2. Logistic regression analysis identified
   - sIUGR (41): Odds Ratio 1.43, 95% CI (1.10 – 1.87), P = 0.004
   - TTTS (16): Odds Ratio 2.07, 95% CI (1.28 – 3.34), P = 0.003
   - TAPS (7): Odds Ratio 1.02, 95% CI (0.90 – 1.16), P = 0.84
   - IUDF of one: Odds Ratio 0.54, 95% CI (0.30 – 0.96), P = 0.05

3. Median gestational age at delivery: 35 weeks and 6 days (IQR 34w0d – 36w3d)
4. Mode of delivery
   - Cesarean section: 73.4%
   - Vaginal delivery: 26.6%
5. Median birth weight: 2,237 grams (IQR 1,925 – 2,495)
6. NICU admissions: 76 pregnancies (58.7%)

Results (continued)

Third Trimester MCA_{psv}

<table>
<thead>
<tr>
<th>Outcome</th>
<th>Odds Ratio</th>
<th>95% CI</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>TTTS</td>
<td>2.23</td>
<td>1.10 – 4.76</td>
<td>0.03</td>
</tr>
<tr>
<td>TAPS</td>
<td>1.09</td>
<td>0.39 – 3.04</td>
<td>0.87</td>
</tr>
<tr>
<td>sIUGR</td>
<td>1.23</td>
<td>0.73 – 2.05</td>
<td>0.44</td>
</tr>
<tr>
<td>Mode of delivery</td>
<td>1.85</td>
<td>0.57 – 5.99</td>
<td>0.31</td>
</tr>
<tr>
<td>IUDF</td>
<td>0.92</td>
<td>0.30 – 2.82</td>
<td>0.89</td>
</tr>
<tr>
<td>NICU admission</td>
<td>3.94</td>
<td>1.31 – 11.85</td>
<td>0.02</td>
</tr>
</tbody>
</table>

Table 1. Logistic regression analysis of MCA_{psv} in the third trimester as a predictor of complications in MCDA twin pregnancies

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Conclusions

• Intertwin MCA_{psv} in the third trimester is an early predictor of TAPS in MCDA twin pregnancies to assist in detection of TAPS
• MCA evaluation may be of clinical utility in the surveillance of MCDA twin pregnancies

ROC curves identified maximum MCA_{psv} in the third trimester (area under ROC curve (AUC) 0.94) as a strong predictor of TAPS, but not in the second trimester (AUC 0.56). OPTIMAL CUT OFF POINT: MCA_{psv} = 20.55 SENSITIVITY = 100% SPECIFICITY = 78%