**P19.09** Novel 3D-extended field of view multi-probe ultrasound for placenta volumetry: feasibility and comparison with MRI

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**Objectives**

- *In utero* assessment of placental volume (PV) may be a useful predictor of adverse pregnancy outcome several weeks’ prior to confirmation of fetal growth restriction.

- Research efforts in this area have been limited because the narrow ultrasound (US) sector width cannot accommodate the whole placenta beyond the first trimester.

- Our novel 3D-extended field of view multiprobe ultrasound (3D-eFoV MPUS) technology uses 2 or 3 simultaneously scanning transducers to acquire 3D placental volume data.

**Methods**

- 5 paired placental US and MRI scans were acquired as part of the iFIND project (mean gestational age = 30w2d).

- PV was estimated from semi-automatic segmentations of both 3D-eFoV MPUS reconstructions (fig 1) and MRI T2 sagittal uterus sequences (fig 2).

- Inter-observer and inter-modality PV variability was assessed.

**Results**

<table>
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<tr>
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<th>3D-eFoV mean inter-observer difference</th>
<th>MRI mean inter-observer difference</th>
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</thead>
<tbody>
<tr>
<td>Inter-modality</td>
<td>10.78%</td>
<td>35.52%</td>
</tr>
<tr>
<td>PV difference</td>
<td>63.70ml</td>
<td>176.16ml</td>
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</table>

Mean inter-modality difference (3D-eFoV vs. MRI) 28.94% 151.44ml

**Conclusion**

- Low inter-observer variability for PV estimation using 3D-eFoV, high variability with MRI.

- Systematic inter-modality PV differences may be related to volume acquisition / segmentation methods.

- Refinement of 3D-eFoV acquisition technique required to ensure full coverage.

- Larger sample size essential for comparison with ground truth PV and statistical analysis for correlation with estimated fetal weight / actual birthweight.