The effect of placental location on uterine artery Doppler measurements

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Introduction
Optimum uterine blood flow is of pivotal importance needed for adequate implantation of the embryo and further development of the fetus. We hypothesize distribution of blood supply to the pregnant uterus is not uniform and dependant on placental location.

Methods and Material
A total of 62 singleton pregnancies reporting at the Prenatal Diagnostic Centre of the MUMC+ between September 2012-February 2018 and having their placenta located on either the right or left side of the uterus, were evaluated retrospectively. Experienced sonographers determined the location of the placenta in relation to the midline. Left and right uterine artery (UtA) pulsatility index (PI) were measured using a 4-8 mHz abdominal transducer. Percentiles of the PI corrected for gestational age (GA) were calculated offline. A minimum of two measurements per patient was performed during all pregnancy trimesters. Statistical analysis was performed using Student T-test.

Results
In total, 184 UtA measurements were recorded between 10-38 weeks of gestation. The placenta was located right-sided in 77 cases (41.6%) and left-sided in 107 cases (58.4%). Mean UtA-PI with a ipsilateral sided placenta was significantly lower, compared to a contralateral sided placenta. When correcting for GA, differences remained statistically significant. Mean left UtA-PI showed in both left- and right sided placenta a decrease of 0.04/week, compared to a mean right UtA-PI decrease of 0.03/week in both left- and right sided placenta. No significant differences were found in birthweight or gestational age at delivery between right- or left-sided placentas.

Conclusion
These findings indicate a raised resistance in contralateral uterine arteries when compared with their ipsilateral counterparts in case of placenta laterality. Further research is needed to answer the principal question if this finding is already a preconceptional occurrence leading to placental laterality.

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184 UtA measurements

<table>
<thead>
<tr>
<th>Right-sided placenta</th>
<th>Left-sided placenta</th>
</tr>
</thead>
<tbody>
<tr>
<td>77</td>
<td>104</td>
</tr>
<tr>
<td>Left UtA-PI</td>
<td>1.4 ± 0.7</td>
</tr>
<tr>
<td>Right UtA</td>
<td>1.1 ± 0.5</td>
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