Inter-correlation between Placental Genes Regulating Fetal Glucocorticoid Exposure and IGF2 in Maternal Severe Obesity: A Mechanism for Higher Birth Weight?

Mina TH, Riley SC, Norman JE, Reynolds RM Tommy’s Centre for Fetal and Maternal Health, The University of Edinburgh

INTRODUCTION

1) Exposure to prenatal maternal obesity is associated with high birth weight.
2) One potential biological mechanism is altered placental regulation of fetal growth.
3) Excess fetal glucocorticoid exposure associates with lower birth weight and placental Insulin-like Growth Factor (IGF2) may be modulated by glucocorticoids.

Hypothesis: The expression profiles of placental genes leading to reduced glucocorticoid exposure and increased IGF2 mRNA level correlate with higher birth weight in severely obese pregnancy.

MATERIALS & CLINICAL PROTOCOL

RESULT 1: MEASUREMENTS AT BIRTH

<table>
<thead>
<tr>
<th>Anthropometry Output</th>
<th>LEAN</th>
<th>SO</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Birth weight (grams)</td>
<td>3457.79 (433.54)</td>
<td>3578.16 (643.39)</td>
<td>0.307</td>
</tr>
<tr>
<td>Birth length (cm)</td>
<td>52.91 (2.59)</td>
<td>54.13 (4.48)</td>
<td>0.11</td>
</tr>
<tr>
<td>Birth BMI (kg/m²)</td>
<td>12.28 (1.17)</td>
<td>12.00 (1.92)</td>
<td>0.477</td>
</tr>
<tr>
<td>SDS birth weight</td>
<td>0.06 (0.92)</td>
<td>0.44 (1.18)</td>
<td>0.096</td>
</tr>
<tr>
<td>SDS birth length</td>
<td>1.23 (1.17)</td>
<td>1.72 (1.60)</td>
<td>0.151</td>
</tr>
<tr>
<td>SDS BMI</td>
<td>-0.91 (1.10)</td>
<td>-0.95 (1.40)</td>
<td>0.903</td>
</tr>
</tbody>
</table>

Data displayed = mean (SD). P values were obtained from student’s T-test. Length of gestational age was not significantly different by maternal obesity status.

- Infants of SO pregnancy in this subgroup were not heavier, longer and/or had higher higher BMI.
- Due to the significant difference in fetal sex composition it is important to adjust for sex in the downstream analysis.

RESULT 2: OVERALL GENE EXPRESSION

RESULT 3: CORRELATION BETWEEN ANTHROPOMETRIC OUTPUT & GENE EXPRESSION

IN VOLVING GLUCOCORTICOID- LINKED PLACENTAL GENE EXPRESSIONS

IN VOLVING PLACENTAL IGF2

DISCUSSION, CONCLUSION, FURTHER STUDIES

• Our inter-correlation findings in the placental mRNA profiles support the biological findings elsewhere that IGF2 family could be downstream targets of glucocorticoid signalling (Vaughan et al., 2012).
• The correlation data between placental genes and body compositions at birth are in line with our hypothesis.
• Works to expand the placental pool to enable association analysis are currently undertaken.

ACKNOWLEDGEMENT

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REFERENCE