Antenatal depression & infant sleep: examining the moderating effects of a polymorphism in the serotonin transporter promoter gene area (5-HTTLPR) & infant temperament

Netsi, E.¹, Murphy S.E¹, Wulff, K.², Ramchandani, P.G.¹
¹ Department of Psychiatry, Oxford University, ²Nuffield Laboratory of Ophthalmology, Oxford University

Introduction
Infant Sleep
• Marker of bio-behavioural organization
• Associated with mental and psychomotor development³

Antenatal Depression predicts infant sleep (also established using this cohort²).

Differential Susceptibility Hypothesis ³ Individuals more susceptible to negative environmental influences are the ones which would benefit the most in a supportive environment.

2 plasticity factors are examined here
• plasticity gene - 5-HTTLPR
• plasticity factor – reactive temperament (this construct describes infants who are more irritable and fussy, cry more and do not respond well to novel stimuli)

This is the first study to look at the moderating effect of 5-HTTLPR and reactive temperament in antenatal depression and infant sleep.

Aims:
To examine whether the relationship of antenatal depression & infant sleep is moderated by
i) 5-HTTLPR
ii) Reactive temperament

Sample
Avon Longitudinal Study of Parents and Children (ALSPAC) cohort (n=14,663)

5-HTTLPR data n=4,385
Reactive temperament data n=8,310

• Maternal age 29 years (SD 4.7)
• Background: White Caucasian (97.4%) (non-White exic. for 5-HTTLPR analysis)
• Education: 16.4% University degree

Analysis: Hierarchical Linear Model
Step 1: depression, moderators, covariates
Step 2: three 2-way interactions
Step 3: 3-way interaction

Measures
Infant sleep: number of night-time awakenings and sleep problems at 18 & 30 months
5-HTTLPR: Subjects were grouped into those homozygous for the short allele (Low expression), heterogeneous (Medium expression) and those homozygous for the long allele (High expression). L₂ allele carriers were treated as S allele carriers for the purposes of grouping. Data in H-W equilibrium: Low: SS, S_L₂ (23.3%), Medium: S_L₂, L₂L₂ (51.2%), High: L₂L₂ (25.4%).

Reactive temperament: intensity, threshold, approach, adaptability (α=.76).

Antenatal and postnatal depression: EPDS at 32 weeks gestation and 8 weeks postnatal.

Socio-demographic characteristics: smoking, alcohol consumption, maternal education, marital status, crowding and maternal age (not shown)

Results

<table>
<thead>
<tr>
<th>Variables</th>
<th>Sleep problems</th>
<th>Awakening</th>
<th>Sleep problems</th>
<th>Awakening</th>
</tr>
</thead>
<tbody>
<tr>
<td>β</td>
<td>p</td>
<td>β</td>
<td>p</td>
<td>β</td>
</tr>
<tr>
<td>Antenatal Depression</td>
<td>0.46</td>
<td>.300</td>
<td>-0.20</td>
<td>.672</td>
</tr>
<tr>
<td>Postnatal Depression</td>
<td>0.064</td>
<td>.000</td>
<td>0.393</td>
<td>.036</td>
</tr>
<tr>
<td>5-HTTLPR/Reactivity</td>
<td>0.163</td>
<td>.172</td>
<td>0.044</td>
<td>.345</td>
</tr>
<tr>
<td>Gender</td>
<td>-0.017</td>
<td>.249</td>
<td>-0.008</td>
<td>.585</td>
</tr>
</tbody>
</table>

Dep. x 5-HTTLPR/Dep. x Reactivity | .012 | .791 | 0.062 | .192 | .116 | .001 | .101 | .003 |

Depression x Gender x 5-HTTLPR/Reactivity | -0.014 | .767 | -0.063 | .183 | -0.088 | .008 | -0.085 | .013 |

Conclusion
There was no evidence that 5-HTTLPR moderates antenatal depression and infant sleep.

Strengths
• Large community sample
• Tri-allelic classification of 5-HTTLPR
• Widely used questionnaires

Limitations
• Controlling for important confounders
• Sleep data subject to reporter bias

References

Disclosure
This research is financially supported by MRC’s educational grant from the Medical Research Council.