Neurobiological correlates of Disruptive Behaviour Disorder in a normal population: differences between boys and girls

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Introduction

Disruptive Behaviour Disorders (DBD) have been associated with decreased cortisol levels, the main stress hormone produced by the Hypothalamic-Pituitary-Adrenal (HPA)-axis\textsuperscript{1,2}. In normal population samples however, results are inconclusive\textsuperscript{3}, as normal population studies are hampered by a low prevalence of DBD. This is especially true for girls, who have consequently remained under-investigated.

This study aims to elucidate the relation between disruptive behaviour and cortisol in a normal population sample, by: over-sampling high-risk boys and girls; differentiating disruptive behaviour; parent vs. self reported, and type of behaviour.

Methods

**Participants**

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<tr>
<th>Normal population</th>
<th>219 boys</th>
<th>153 girls</th>
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<tr>
<td>Over-sampling:</td>
<td>43% at high risk of developing DBD</td>
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<td>Mean age:</td>
<td>14.0 years ± 0.5</td>
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**Disruptive behaviour measures**

Diagnostic Interview Schedule for Children – Parent version (DISC-P)
- Diagnosis DBD
- Child Behaviour Check List (CBCL) & Youth Self Report (YSR)
  - Aggression and delinquency score

**Cortisol**

Cortisol Awakening Response (CAR)\textsuperscript{4}
- Area Under the Curve (AUC\textsubscript{G})\textsuperscript{5}

Results

**Disruptive Behaviour Disorder – diagnosis**

- DDB girls show a lower AUC\textsubscript{G} than control girls (F=6.995, p<.05).
- DDB boys do not differ in AUC\textsubscript{G} from controls (F=.838, ns).

**Aggression**

Parent reported (CBCL):
- Only decreased AUC\textsubscript{G} for aggressive boys compared to controls (F=8.571, p<.005).
- Self reported (YSR):
  - Both for aggressive boys and girls trend towards decreased AUC\textsubscript{G} (F=3.207, p<.10).

**Delinquency**

Parent reported (CBCL):
- Delinquent boys and girls increased AUC\textsubscript{G} compared to controls (F=4.156, p<.05).
- Self reported (YSR):
  - No differences in AUC\textsubscript{G} (F=.107, ns).

Discussion

- Disruptive Behaviour Disorder is only associated with decreased cortisol levels in girls.
- Suggesting that in the normal population disruptive behaviour in girls may be more strongly associated with neurobiology, than in boys.
- Particularly aggression, but not delinquency, is related to decreased cortisol levels.
- Disruptive behaviour should be, in relation to basal cortisol, assessed more distinctively.
- The DBD and borderline/ clinical groups are small, in spite of over-sampling of high-risk youth, suggesting that even stronger over-sampling methods may be needed in future research.

References


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