Associations between maternal and offspring hair cortisol concentrations and child behavioral symptoms in pairs of children 18-48 months old and their mothers with and without perinatal mental disorders

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Introduction

Maternal perinatal mental disorders (PMD) are associated with developmental and behavioral problems in the offspring, probably mediated by the hypothalamic-pituitary-adrenall (HPA) axis. Increased cortisol concentrations during pregnancy and the perinatal period are related to alterations in stress responses of the offspring and with child behavioral and emotional problems, though such associations are still unclear.

Methods

We compared 16 mothers with a history of PMD and their children (46.7% girls; mean age in months 31.1 (8) with 30 aged-matched control mothers and their children (50.0% girls; mean age in months 34.9 (8). Participants of both groups were evaluated with a clinical interview, the Depression Anxiety Stress Scale (DASS-42) and the Child Behavior Checklist 1%-5 (CBCL 1%-5) questionnaires. We measured mother and child hair cortisol concentrations. To estimate cortisol levels, we used the automatic Electrochemiluminescence immunoassay “Cortisol II” in an automatic analyzer.

Results

1. Mothers of the PMD group scored significantly higher ADHD symptoms in their children (p=0.035) compared to the control group ones.

2. A positive linear association between maternal and child hair cortisol was found in the total sample of mother-child pairs, as well as in the control group. However the association was not significant in the PMD group.

3. In the PMD group, T-scores of the “Anxiety / Depressed” scale correlated positively and significantly with child’s hair cortisol concentrations whereas, T-scores of the “Aggressive Behavior” and the “Oppositional Defiant Problems” correlated positively and significantly with both maternal and child hair cortisol concentrations.

Conclusions

These findings suggest that a chronic dysregulation of maternal and child HPA axis and their associations in the PMD pairs may underlie the relations between chronic maternal stress and child behavioral and emotional problems and stress responses.