

Associations between Early Life Stress, Prenatal Stress, Hair Cortisol and Birth Outcomes

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Introduction

Maternal **early life stress (ELS)** as well as prenatal psychosocial stress have been associated with adverse birth outcomes including pre-term delivery, lower birth weight and altered stress reactivity in the infant ([Bussières et al. 2015](#); [Nesari et al. 2018](#)). The underlying mechanisms are poorly understood, although the stress hormone cortisol is thought to play an important role ([Cherak et al. 2018, 2019](#)). Previous studies suggest that ELS might alter cortisol regulation during pregnancy, which in turn influences birth outcomes. It is unclear whether these associations also hold when measurements of long term cortisol, such as **hair cortisol (HCC)**, are utilized, whether ELS and prenatal stress interact in relation to HCC, whether there is a general increase in HCC during pregnancy and whether the variability in change over time is related to ELS, prenatal stress or birth outcomes ([King et al. 2022](#)).

Objectives

1. Does HCC increase during pregnancy?
2. Are ELS and prenatal stress associated with HCC or change in HCC?
3. Is there an interaction between ELS and prenatal stress in relation to HCC?
4. Is HCC or change in HCC related to birth outcomes?

Methods

Sample and Measures

Participants (N = 69) were recruited at ‘Hospital Español de Mendoza’ in Argentina between 3rd April – 28th April 2017. Questionnaires were collected 2–3 days after delivery and a 9cm hair sample from the back of the mothers’ head was taken close to the scalp. ELS was measured with **Childhood Trauma Questionnaire (CTQ)** and the **Adverse Childhood International Questionnaire (ACE)**. Prenatal stress was measured with an adapted version of the **Life Events Questionnaire (LEI)**.

Statistical Analysis

- multiple imputation (predictive mean matching)
- Bayesian Networks with robust (hierarchical) linear models (figure shows only small part of the network)

Increase in Hair Cortisol related to low birth weight – but what about the wash out effect?

