

Pathways from prenatal and postnatal stress to sleep quality across childhood: The role of the amygdala and cortisol

ABSTRACT:

Early life stress is robustly associated with poor sleep across life. Preliminary studies suggest that these associations may begin already in utero. Here, we study the longitudinal associations of prenatal psychosocial stress with sleep across childhood, and assess whether prenatal stress interacts with genetic liability and cortisol levels for poor sleep.

The study is embedded in the Generation R population-based birth cohort. Caregivers reported on prenatal psychosocial stress (life events, contextual, parental or interpersonal stressors) and on children's sleep at ages 2 months, 1.5, 2, 3 and 6 years. The study sample consisted of 4,930 children; polygenic risk scores for sleep traits were available in 2,063. In a subsample (n=1500) we also analyzed interactions between prenatal psychosocial stress and hair cortisol levels on sleep pre-adolescence.

Prenatal stress was consistently associated with more sleep problems across assessments. Effect sizes ranged from small ($B = 0.21$, 95%CI: 0.14;0.27) at 2 months to medium ($B = 0.45$, 95%CI: 0.38;0.53) at 2 years. Prenatal stress was moreover associated with shorter sleep duration at 2 months (Bhrs = -0.22, 95%CI: -0.32;-0.12) and at 2 years (Bhrs = -0.04, 95%CI -0.07; -0.001), but not at 3 years (Bhrs = 0.02, 95%CI: -0.02;0.06). Prenatal negative life events interacted with polygenic risk for insomnia to exacerbate sleep problems at 6 years ($B_{\text{interaction}} = 0.07$, 95%CI: 0.02;0.13). Associations between prenatal stress and sleep in preadolescence were not modified by cortisol levels.

Psychosocial stress during pregnancy has negative associations with children's sleep that persist across childhood, and are exacerbated by genetic liability for insomnia. Associations with sleep duration were more pronounced in infancy and seem to attenuate with age. These findings highlight the role of the prenatal environment for developing sleep regulation, and could inform early intervention programs targeting sleep in children from high-risk pregnancies.

Keywords

Prenatal Stress, Sleep Problems, Sleep Duration, Polygenic Risk Score

Published Work:

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