

TURUN YLIOPISTO
Lääketieteellinen tiedekunta

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Syventävien opintojen kirjallinen työ, 22 s.
Psykiatria
Toukokuu 2018

Poor maternal sleep quality during pregnancy may act as a prenatal stress factor for the fetus and associate with neonate neurocognition, for example via fetal programming. The impacts of worsened maternal sleep on neonatal development and, more specifically on neonatal auditory brain responses, have not been studied.

A total of 155 mother-neonate dyads drawn from the FinnBrain Birth Cohort Study participated in our study including maternal self-report questionnaires on sleep at gestational week 24 and an event-related potential (ERP) measurement among 1-2-day-old neonates. For sleep quality assessment, the Basic Nordic Sleep Questionnaire (BNSQ) was used and calculated scores for 1) insomnia, 2) subjective sleep loss and 3) sleepiness were formed and applied in the analyses. In the auditory ERP protocol, three emotionally uttered pseudo words (in *happy*, *angry* and *sad* valence) were presented among neutrally uttered pseudo words. To study the relations between prenatal maternal sleep quality and auditory emotion-related ERP responses, linear regression models were computed for early (100-200 ms) and late (300-500 ms) ERP response time-windows.

All of the selected BNSQ scores were associated with neonatal ERP responses for *happy* and *angry* emotion stimuli (sleep loss and sleepiness in the early, and insomnia, sleep loss and sleepiness in the late time-window). For *sad* stimuli, only maternal sleep loss predicted the neonatal ERP response in the late time-window, likely because the overall ERP was weakest in the *sad* condition. We conclude that maternal sleep quality during pregnancy is associated with changes in neonatal auditory ERP responses.

Key words: pregnancy, sleep, neonate, event-related potential