insomnia, nocturnal perinatal-focused rumination, daytime sleepiness, depression, and poor infant sleep. Postnatal insomnia predicted future decreases in mother-infant relationship quality, and nocturnal cognitive hyperarousal partially mediated this association.
Conclusion: Both maternal and infant sleep problems were associated with impairments in mother-to-infant bonding, independent of the effects of maternal depression and difficult infant temperament. Perseverative thinking at night, particularly on infant-related concerns, was linked to impaired bonding, rejection and anger, and infant-focused anxiety. Improving maternal and infant sleep, as well as maternal cognitive-emotional regulation, may improve the maternal-to-infant bond.
Support (if any): This work was funded by the American Academy of Sleep Medicine (198-FP-18, PI: Kalmbach). Dr. Cheng's effort was supported by the National Heart, Lung, and Blood Institute (K23 HL138166, PI: Cheng).

542

OBJECTIVE SLEEP DURATION, SLEEP TIMING AND COMPLETION OF IN VITRO FERTILIZATION CYCLES; A PROSPECTIVE COHORT STUDY

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Introduction: Sleep duration and circadian misalignment have been linked to fertility and fecundability. However, sleep in women undergoing IVF has rarely been examined. This study investigated the role of sleep duration and timing with completion of an IVF cycle.
Methods: Prospective study of women undergoing IVF at a tertiary medical center between 2015 and 2017. Sleep was assessed by wrist-worn actigraphy 1–2 weeks prior to the initiation of their IVF cycle. Reproductive profile, IVF cycle details, demographic and health information were obtained from medical charts. Sleep duration, midpoint and bedtime were examined in relation to IVF cycle completion using logistic regression models, adjusted for age and anti-Müllerian hormone levels. A sub-analysis excluded women who worked non-day shifts to control for circadian misalignment.
Results: A total of 48 women were studied. Median age was 33y (range 25–42), with 29% of women older than 35 years. Ten women had an IVF cycle cancellation prior to embryo transfer. These women had shorter sleep duration, more nocturnal awakenings, lower sleep efficiency, and later sleep timing in comparison to those who completed their cycle. Twenty-minute increases in sleep duration were associated with lower odds of an uncompleted IVF cycle (OR = 0.88; 95% CI 0.78, 1.00). Women with later sleep midpoints and later bedtime had higher odds of an uncompleted cycle relative to those with earlier midpoints and earlier bedtime; OR=1.24; 95% CI 1.09, 1.40 and OR=1.33; 95% CI 1.17, 1.53 respectively, per 20-minute increments. These results were independent of age, levels of anti-Müllerian hormone, or sleep duration, and remained unchanged after exclusion of shift-working women.
Conclusion: This study demonstrated the influence of sleep duration and sleep timing on the odds of an uncompleted IVF cycle prior to embryo transfer. Sleep is a modifiable behavior that may contribute to IVF cycle success.
Support (if any):

543

EEG-BASED DEEP NEURAL NETWORK MODEL FOR BRAIN AGE PREDICTION AND ITS ASSOCIATION WITH PATIENT HEALTH CONDITIONS

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Introduction: Electroencephalogram (EEG) provides clinically relevant information for personalized patient health evaluation and comprehensive assessment of sleep. EEG-based indices have been associated with neurodegenerative conditions, psychiatric disorders, and metabolic and cardiovascular disease, and hold promise as a biomarker for brain health.
Methods: A deep neural network (DNN) model was trained to predict the age of patients using raw EEG signals recorded during clinical polysomnography (PSG). The DNN was trained on N=126,241 PSGs, validated on N=6,638, and tested on a holdout set of N=1,172. The holdout dataset included several categories of patient demographic and diagnostic parameters, allowing us to examine the association between brain age and a variety of medical conditions. Brain age was assessed by subtracting the individual's chronological brain age from their EEG-predicted brain age (Brain Age Index; BAI), and then taking the absolute value of this variable (Absolute Brain Age Index; ABAI). We then constructed two regression models to test the relationship between BAI/ABAI and the following list of patient parameters: sex, BMI, depression, alcohol/drug problems, memory/concentration problems, epilepsy/seizures, diabetes, stroke, severe excessive daytime sleepiness (e.g., Epworth Sleepiness Scale ≥ 16; EDS), apnea-hypopnea index (AHI), arousal index (ArI), and sleep efficiency (SE).
Results: The DNN brain age model produced a mean absolute error of 4.604 and a Pearson's r value of 0.933 which surpass the performance of prior research. In our regression analyses, we found a statistically significant relationship between the ABAI and: epilepsy and seizure disorders, stroke, elevated AHI, elevated ArI, and low SE (all $p<0.05$). This demonstrates these health conditions are associated with deviations of one's predicted brain age from their chronological brain age. We also found patients with diabetes, depression, severe EDS, hypertension, and/or memory and concentration problems showed, on average, an elevated BAI compared to the healthy population sample (all $p<0.05$).
Conclusion: We show DNNs can accurately predict the brain age of healthy patients based on their raw, PSG derived, EEG recordings. Furthermore, we reveal indices, such as BAI and ABAI, display unique characteristics within different diseased populations, highlighting their potential value as novel diagnostic biomarker and potential "vital sign" of brain health.
Support (if any):

544

BURDEN OF SLEEP DISTURBANCE IN BLACK PREGNANT WOMEN

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Introduction: Black women disproportionately experience poor perinatal outcomes compared to other racial/ethnic groups. Poor sleep has emerged as a strong contributor to adverse pregnancy outcomes and, in the non-pregnant population, sleep-wake disturbances have a high prevalence with often greater severity among Blacks. Nonetheless, the majority of studies have included largely White populations which has restricted our understanding of race-specific burdens and morbidities of sleep disturbance. The goal was to describe the burden of sleep-wake disturbance in Black pregnant women and associations with pregnancy outcomes.