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Introduction: Obstructive sleep apnea (OSA) is linked with impaired vigilance, attention, memory and executive function. However, this evidence largely comes from small experimental studies or larger studies in clinical samples and therefore the scope and magnitude of OSA driven neurobehavioural dysfunction in the general population remains unclear. This study aimed to examine the cross-sectional association between OSA and neurobehavioural function in a large community sample of men.
Methods: A total of 837 participants from the Men Androgen Inflammation Lifestyle Environment and Stress (MAILES) study, a longitudinal cohort of men 40+ years, underwent full overnight polysomnography. Participants completed the inspection time (IT) test, mini-mental state examination (MMSE), Fuld object memory evaluation (FOME), and trail-making test (TMT) part A (TMT-A) and part B (TMT-B). Using regression models adjusted for multiple important covariates, we examined the association between neurobehavioural function scores, clinical metrics of OSA severity (Apnea-Hypopnea Index (AHI); percentage total sleep time with oxygen saturation <90% (TST90), and measures of sleep disruption (duration of rapid eye movement (REM) and non-REM (NREM) sleep; and total sleep time (TST).
Results: In multivariable linear regressions, greater TST was associated with worse IT scores (B=13.688, 95% CI [0.134, 27.241], *P*=0.048) and TMT-B scores (B=19.255, 95% CI [0.931, 37.578], *P*=0.040). In logistic regressions, greater TST was associated with better MMSE scores (Odds ratio [OR]=0.440, 95% CI [0.194, 0.997], *P*=0.049); and higher AHI was strongly associated with worse FOME scores in fully adjusted models (OR=1.358, 95% CI [1.252, 1.472], *P*<0.001).
Conclusion: The AHI and TST were positively, significantly associated with neurobehavioural function across different domains. This cross-sectional data shows that neurobehavioural function deficits in OSA are directly related to sleep and breathing disruptions. Future large prospective studies are needed to determine if OSA and sleep disruption predict future onset of neurobehavioural dysfunction and cognitive decline.
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ASSOCIATIONS BETWEEN OPIOIDS, NON-OPIOIDS AND CENTRAL SLEEP APNEA: A CASE-CONTROL STUDY

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Introduction: Opioids are known to contribute to central sleep apnea (CSA), as they depress responsiveness to carbon dioxide and hypoxia. However, the role of non-opioid medications (antihistamines, myorelaxants, neuroleptics, antidepressants, and hypnotics) in CSA remains unclear. Given the hypothesized impact of non-opioids on the central nervous system, we examined associations between opioid and non-opioid medications and CSA.
Methods: Among all adults who underwent polysomnography testing at the University of Michigan's Sleep Center between 2013-2018 (n=10,479), we identified 105 cases of CSA. Of these patients, we randomly selected 300 controls. Demographic and health characteristics, use of medications were obtained from medical charts. We classified study participants into three categories based on medication use: non-opioids only, opioids alone or in combination with non-opioids, and none. CSA was defined as a binary outcome using polysomnographic criteria as per the International Classification of Sleep Disorders-Third Edition. We used logistic regression to examine associations between medication use and CSA.
Results: Among participants, male:female ratio was 1:1 with a mean age of 49 (±14.3 SD) years. Opioid use alone was rare (4%), but more common in combination with non-opioids (17%), while the exclusive use of non-opioids was found among 38%. In adjusted analyses for age and sex, those who used non-opioid alone were less likely to have a CSA diagnosis (OR=0.88, (95% CI 0.5-1.6); however, the use of opioids (alone or in combination with non-opioids) was associated with a 4-fold higher odds of CSA.
Conclusion: These data suggest that non-opioids have a protective influence on CSA. Conversely, opioids, alone, or in combination with non-opioids, were associated with increased CSA risk, that may be attributed to opioids alone, or to opioids and non-opioids interactions. However, as opioids were mostly co-prescribed with non-opioids, the sole effect of opioids from the synergistic effect with non-opioids are difficult to disentangle.
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ALTERED BRAIN NETWORK ORGANIZATION IN PATIENTS WITH OBSTRUCTIVE SLEEP APNEA

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Introduction: Previous functional MRI (fMRI) studies have reported altered brain networks in patients with obstructive sleep apnea (OSA), but the extent of such abnormal connectivity was inconsistent across studies. Moreover, despite the important role of the cerebellum in respiration and OSA, connections of the cerebellum to the cerebral cortex have been rarely assessed. Here, we investigated functional network changes in cerebral and cerebellar cortices of OSA patients.
Methods: Resting-state fMRI, polysomnography and neuropsychological (NP) tests data were acquired from 74 treatment naïve OSA patients (age: 45.8±10.7 years, apnea-hypopnea index: 46.4±18.5 /h) and 33 normal controls (39.6±9.3 years). Connectivity matrices were extracted by computing correlation coefficients from various ROIs, and Fisher r-to-z transformations. ROIs consisted of