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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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 neuro-psychological (NP) tests data were acquired from 74 treatment naive OSA patients (age: 45.8±10.7 years, apnea-hypopnea index: 46±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...