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Introduction: The association between sleep spindles and cognitive function and the potential confounding influence of obstructive sleep apnea (OSA) remains uncertain. This study examined cross-sectional associations between sleep spindle metrics and cognitive function outcomes in community-dwelling men.

Methods: Men, Androgen, Inflammation, Lifestyle, Environment, and Stress (MAILES) study participants (n=477) underwent home-based polysomnography between 2010–2011 and completed the inspection time task, trail-making test A (TMT-A) and B (TMT-B), and Fuld object memory evaluation. Frontal spindle metrics derived from sleep electroencephalography included occurrence (total no. of sleep spindle events) and slow (11–13 Hz) and fast (13–16 Hz) spindle density (no./min) during N2 and N3 sleep.

Results: Men with OSA (any OSA and severe OSA) had significantly impaired sleep spindles (reduced occurrence and densities). In the complete study sample, higher spindle occurrence during N2 sleep was independently associated with faster inspection time (B= -0.44, 95% CI [-0.87, -0.02], p=0.041), whereas higher fast spindle density during N3 sleep was independently associated with worse TMT-B performance (B=20.7, 95% CI [0.55, 40.9], p=0.044). Furthermore, in men with severe OSA (apnea-hypopnea index ≥30/h), higher slow spindle density during N2 sleep was independently associated with worse TMT-A and TMT-B performance, whereas only higher spindle occurrence during N2 sleep was independently associated with worse TMT-A performance (all p<0.05).

Discussion: Specific spindle metrics during N2 and N3 sleep are independently associated with cognitive function in an unselected population of men and men with undiagnosed severe OSA. The utility of sleep spindles for predicting cognitive dysfunction and decline requires further investigation.

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SLEEP DISTURBANCES ARE ASSOCIATED WITH POOR NEUROBEHAVIOURAL OUTCOMES FOLLOWING TRAUMATIC BRAIN INJURY: A STUDY OF MILITARY SERVICE MEMBERS AND VETERANS

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Introduction: Sleep disturbances are pervasively reported in military service members and veterans, especially following traumatic brain injury (TBI). The purpose of this study was to examine the association between sleep disturbances and neurobehavioural outcomes in a large group of U.S. military service members and veterans, with and without a history of TBI.

Methods: Participants were enrolled into the Defense and Veterans Brain Injury Center/Traumatic Brain Injury Center of Excellence, 15-Year Longitudinal TBI study (N = 606). Participants self-reported sleep disturbances (PROMIS 8A) and neurobehavioral symptoms. Data were analyzed using analysis of variance with post-hoc comparisons. Four groups were analyzed separately: uncomplicated mild TBI (MTBI; n=218); complicated mild, moderate, severe, or penetrating - combined TBI (CTBI; n=118); injured controls (IC, i.e., orthopedic or soft-tissue injury without TBI; n=162); and non-injured controls (NIC; n=108).

Results: Participants in the MTBI group reported the highest proportion of moderate-severe sleep disturbances (66.5%) compared to the IC (54.9%), CTBI (47.5%), and NIC groups (34.3%). Participants classified as having Poor Sleep reported significantly worse scores on almost all TBI-QOL scales compared to those classified as having Good Sleep, regardless of TBI severity or even the presence of TBI (ps<.05, Cohen's ds>.3).

Discussion: This study demonstrates that sleep disturbances remain a prevalent and debilitating concern in service member and veteran populations. Regardless of group (injured or NIC), sleep disturbances were common and were associated with significantly worse neurobehavioral functioning. When assessing and treating neurobehavioural symptoms, it is important to assess sleep, especially in service member and veteran populations.

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UNDER-MATTRESS SLEEP MONITORING TO PREDICT READMISSION RISK AFTER COPD EXACERBATION

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Background: Recurrent hospitalisation for COPD exacerbations is a major contributor to disease burden and healthcare costs. This study aims to establish if post-discharge sleep or vital sign parameters are predictive of hospital readmissions after COPD exacerbations.

Methods: Patients admitted with a COPD exacerbation were recruited from November 2019 until May 2021. Sleep parameters were assessed for at least one night in hospital and 10 nights post-discharge using an under-mattress device (EarlySense). Analysis on data from the first 26 participants were conducted using independent sample Mann-Whitney U tests comparing device-estimated sleep parameters between participants admitted versus not readmitted at one- and three-months post-discharge.

Progress to date: Thirty-four participants have consented. In the 26 participants completing the study to date, all-cause hospital readmission rates at one- and three-months were 26% and 65% respectively. Participants readmitted versus not readmitted at one-month had lower percentage of time in light sleep (43 ± 12% vs 58 ± 12%, p=0.029) and lower estimated AHI (5.6 ± 1.9 vs 17 ± 11 /hr, p=0.042). There were no differences at three-months.