the Perceived Stress Scale (PSS), Beck Depression Inventory-II (BDI-II), and Beck Anxiety Inventory (BAI).
Results: A series of general linear models were used to determine the relationship between RBD symptoms and cognition. Race/ethnicity, depressive symptoms, and estimated intellectual ability were included as covariates. Using a cutoff score of five (range: 0-13) on the RBDSQ, the ANCOVAs determined that there was no association between RBD symptoms and the cognitive domains of attention, processing speed, executive function, and working memory. However, there was a trend for attention as measured by the Identification task ($F(1,41) = 3.85$, $p = 0.057$). Interestingly, Pearson's chi-square test revealed that the relationship between depressive symptoms and RBD symptoms was significant ($\chi 2 = 6.87$, $p = 0.009$). Those who had high RBD symptoms were more likely to have high depressive symptoms.
Conclusions: Our analyses indicated that in healthy young adults, RBD symptoms are not associated with the cognitive domains of attention, processing speed, executive function, or working memory. However, there may be a trend for attention, which warrants further research with a larger sample size. Of interest, young adults with RBD symptoms were more likely to have clinically significant depressive symptoms. Given that RBD in older adults is associated with incident dementia with Lewy body and Parkinson's disease, which are associated with cognitive decline and depression, further work is necessary to explore the mechanisms of this connection as well as the development of clinical disorders.

Categories: Sleep and Sleep Disorders
Keyword 1: attention
Keyword 2: depression
Keyword 3: sleep disorders
Correspondence: Theresa Lin, Fordham University, tlin69@fordham.edu

78 The Effects of Hypertension and Obstructive Sleep Apnea on Auditory Learning and Memory in Veterans with PTSD Symptomology

Valerie Z. Alipio Jocson[1], Julie Gretler[1], Marcel Chen[1], Jerome A. Yesavage[1,2], Lisa M. Kinoshita[1]

[1]Veterans Affairs Palo Alto Health Care System, Palo Alto, California, USA. [2]Stanford University School of Medicine, Stanford, California, USA

Objective: Obstructive sleep apnea (OSA) has been associated with cognitive deficits as evidenced by neuropsychological testing in the domains of attention/working memory, verbal memory, processing speed, and executive function. OSA is often comorbid with hypertension and has been considered a risk factor for hypertension (Kareem et al., 2018; Tietjens et al., 2019). Both hypertension and OSA have been shown to be independent predictors of memory (Kinoshita et al., 2012). OSA and posttraumatic stress disorder (PTSD) are also frequently co-occurring, especially among veterans. In a group of veterans with a history of PTSD, we seek to explore the effects of sleep apnea and hypertension on cognitive functioning, particularly auditory learning/memory.
Participants and Methods: One hundred and three male and female participants with comorbid OSA and PTSD symptomology were screened as part of a larger VA Palo Alto Health Care System study. Participants (age: $\bar{x}$=56.3, σ=13.8, 24-81 years; education: $\bar{x}$=14.6, σ=2.3, 8-20 years; 9.6% female, 89.6% male) completed a neuropsychological battery, including the CVLT-II and WMS-IV Logical Memory. Presence or absence of hypertension was dichotomously coded and AHI severity was categorically coded. An auditory learning/memory composite variable was created using the z-score transformation method (Dodge et al., 2020). Variables and covariates were entered into a hierarchical regression.
Results: The initial regression model revealed hypertension and OSA severity to be independent predictors of performance on auditory learning/memory (hypertension: β= -0.71, $p<0.01$; OSA: β= -0.42, $p<0.01$), where presence of hypertension or increased severity of OSA resulted in worse performance on the auditory learning/memory composite.
Conclusions: Results suggest that hypertension and OSA may independently and negatively affect performance on measures of auditory learning/memory in veterans with PTSD symptomology and OSA. Such findings underscore the importance of assessing and treating both hypertension and OSA among veterans with PTSD to improve not only physical health, but also cognitive health. Further

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research demonstrating similar findings is recommended along with studies investigating whether or not the treatment of hypertension and OSA can improve auditory learning/memory.

Categories: Sleep and Sleep Disorders
Keyword 1: sleep disorders
Keyword 2: hypertension
Keyword 3: memory: normal
Correspondence: Valerie Z. Alipio Jocson, Ph.D. Veterans Affairs Palo Alto Health Care System valipiojocson@paloaltou.edu

79 Continuous Theta Burst Stimulation (cTBS) over the Inferior Parietal Cortex Decreases Default Mode Connectivity and Improves Overnight Sleep in People with Insomnia

William D. S. Killgore[1], Samantha Jankowski[1], Kymberly Henderson-Arredondo[1], Christopher Trapani[1], Heidi Elledge[1], Daniel Lucas[1], Andrew Le[1], Emmett Suckow[1], Lindsey Hildebrand[1], Michelle Persich[2], Brianna Zahorecz[1], Cohelly Salazar[1], Tyler Watson[1], Camryn Wellman[1], Deva Reign[1], Yu-Chin Chen[1], Ying-Hui Chou[1], Natalie S. Dailey[3]
[1]University of Arizona, Tucson, AZ, USA. [2]Western Kentucky University, Bowling Green, KY, USA. [3]Denver Health, Denver, CO, USA

Objective: Chronic insomnia is a highly prevalent disorder affecting approximately one-in-three Americans. Insomnia is associated with increased cognitive and brain arousal. Compared to healthy individuals, those with insomnia tend to show greater activation/connectivity within the default mode network (DMN) of the brain, consistent with the hyperarousal theory. We investigated whether it would be possible to suppress activation of the DMN to improve sleep using a type of repetitive transcranial magnetic stimulation (rTMS) known as continuous theta burst stimulation (cTBS).
Participants and Methods: Participants (n=9, 6 female; age=25.4, SD=5.9 years) meeting criteria for insomnia/sleep disorder on standardized scales completed a counterbalanced sham-controlled crossover design in which they served as their own controls on two separate nights of laboratory monitored sleep on separate weeks. Each session included two resting state functional magnetic resonance imaging (fMRI) sessions separated by a brief rTMS session. Stimulation involved a 40 second cTBS stimulation train applied over an easily accessible cortical surface node of the DMN located at the left inferior parietal lobe. After scanning/stimulation, the participant was escorted to an isolated sleep laboratory bedroom, fitted with polysomnography (PSG) electrodes, and allowed an 8-hour sleep opportunity from 2300 to 0700. PSG was monitored continuously and scored for standard outcomes, including total sleep time (TST), percentage of time various sleep stages, and number of arousals.
Results: Consistent with our hypothesis, a single session of active cTBS produced a significant reduction of functional connectivity ($p < .05$, FDR corrected) within the DMN. In contrast, the sham condition produced no changes in functional connectivity from pre- to post-treatment. Furthermore, after controlling for age, we also found that the active treatment was associated with meaningful trends toward greater overnight improvements in sleep compared to the sham condition. First, the active cTBS condition was associated with significantly greater TST compared to sham ($F(1,7)=14.19$, $p=.007$, partial eta-squared=.67). Overall, individuals obtained 26.5 minutes more sleep on the nights that they received the active cTBS compared to the sham condition. Moreover, the active cTBS condition was associated with a significant increase in the percentage of time in rapid eye movement (REM%) sleep compared to the sham condition ($F(1,7)=7.05$, $p=.033$, partial eta-squared=.50), which was significant after controlling for age. Overall, active treatment was associated with an increase of 6.76% more of total sleep time in REM compared to sham treatment. Finally, active cTBS was associated with fewer arousals from sleep ($t(8) = -1.84$, $p = .051$, $d = .61$), with an average of 15.1 fewer arousals throughout the night than sham.
Conclusions: Overall, these findings suggest that this simple and brief cTBS approach can alter DMN brain functioning in the expected direction and was associated with trends toward improved objectively measured sleep, including increased TST and REM% and fewer arousals during the night following stimulation. These findings emerged after only a single 40-second treatment, and it remains to be seen whether multiple treatments over several days or weeks

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