this group, such as cognitive behavioral therapy for insomnia or pharmacological interventions. Therefore, it is important to expand the current understanding of the nature of sleep difficulties in those with Alzheimer's Disease.

Methods: Data from the 2018 Health and Retirement Survey was collected from 17,146 older adults. Poisson regression analyses were used to explore the relationship between Alzheimer's Disease as diagnosed by a doctor and sleep difficulties. Individuals who reported no Alzheimer's Disease in the previous wave (N=16,751) were asked if they had since become diagnosed. N=101 individuals reported incident Alzheimer's Disease in the 2-year gap between assessments. Sleep difficulties were assessed by asking participants if they had difficulties initiating or maintaining sleep, waking up too early, and how rested they felt upon awakening. All 4 of these symptoms were coded as "never," "sometimes," or "often."

Results: Unexpectedly, there was a significant decreased risk of developing Alzheimer's Disease among those who reported difficulties maintaining sleep (IRR=0.9962; 95%CI[0.9936,0.9988]; p=0.004), and early morning awakenings (IRR=0.9961; 95%CI[0.9938,0.9984]; p=0.001) "sometimes". When the model was adjusted for sex, race, ethnicity, age, and depression, a similar finding of decreased risk for Alzheimer's Disease for those who reported difficulties maintaining sleep (IRR=0.9953; 95%CI[0.9927,0.9980]; p<0.001), and early morning awakenings (IRR=0.9954; 95%CI[0.9930,0.9978]; p=0.001), "sometimes" were maintained.

Conclusion: Although previous studies have shown that poor sleep may lead to increased risk of Alzheimer's and related dementias, the present study, which examined longitudinal data from a large, national sample of older adults, found that there was no association between frequent sleep disturbances and 2-year incidence of Alzheimer's Disease, and a small association between more mild symptoms and decreased risk. It is possible that the 2-year observation window was insufficient to detect effects. Also, there is a risk of measurement error in collecting self-reported data on sleep and Alzheimer's diagnoses.

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0273

SLEEP DISORDERS AS A POTENTIAL RISK FACTOR FOR DEMENTIA IN ELDERLY ADULTS

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Introduction: Sleep disorders such as insomnia are seen in the early onset of Alzheimer's disease, the most common form of dementia. Simultaneously, sleep disorders may indicate increased risk for the development of dementia. Due to the rate of comorbidity of these two conditions seen in the elderly population, the relationship between dementia and sleep disorders is a topic of interest for researchers. A bidirectional correlation between the two could have important implications in the clinical field exploring factors that lead to dementia

Methods: Data was assessed from 17,146 older adults from the 2018 Health and Retirement Survey. Participants were surveyed using questionnaires regarding both incident dementia or serious memory impairment in the past 2 years and the presence of a sleep disorder, as diagnosed by a doctor or health professional. Those who reported no dementia in the previous wave (N=16,547) were asked if they had been diagnosed since they were last asked. N=185 individuals reported incident dementia in the 2-years between assessments. Responses were coded to either "Yes" or "No". A Poisson regression analysis was conducted to explore the relationship between incident dementia and sleep disorders.

Results: In a sample of older adults, unadjusted results indicate that having a sleep disorder was associated with a 0.6% increased risk of new onset dementia (PRR=1.006; 95%CI[1.001,1.012]; p=0.026). These results were sustained when adjusted for sex, age, race, ethnicity, and depression (PRR=1.006; 95%CI[1.001,1.012]; p=0.013).

Conclusion: Chronic sleep disturbances may be a factor used to indicate increased risk for dementia and help with early detection of the disease. These results demonstrate the value of sleep disorders screening among those at risk for dementia. Further research is needed to clarify these findings (e.g., explore specific sleep disorders) and expand the follow-up window (i.e., beyond 2 years).

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0274

EFFECT OF AGING ON SLEEP ARCHITECTURE INCLUDING A NOVEL REM BEHAVIOR DISORDER PHENOTYPE IN THE PS19 MOUSE MODEL OF TAUOPATHY AND EFFECT OF A DUAL OREXIN RECEPTOR ANTAGONIST

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Introduction: This project examines changes to sleep microarchitecture with aging in the PS19 (MAPT P301S) model of tauopathy and response to a dual orexin receptor antagonist (DORA-12) in aged PS19 mice.

Methods: 24-hour video PSG recordings occurred in 28 PS19 mice and 22 littermate controls at 2-3 months (young) and 10-14 months (old).

Results: Spindle density significantly deceased as a function of both advanced age and PS19 genotype without interaction. We observed a significant interaction between age and genotype on slow oscillation (SO) density such that SO density was higher in young PS19 lower in old PS19 mice vs controls without main effects of age or genotype. Phase amplitude coupling of spindles to detected SO events was significantly decreased as a function of age with a trend toward an age/genotype interaction such that the reduction in coupling was greater with aging in PS19 mice vs controls. We observed unexpected dream enactment during REM in 3 of 11 old PS19 but not in young PS19 mice or control mice at any age. Normalized cumulative EMG area during REM sleep, cumulative duration of elevated EMG in REM, and %REM w/o atonia were all significantly increased in mice displaying dream enactment.Old PS19 mice were also video-PSG recorded for 24 hours while receiving 100 mg/kg DORA-12 vs vehicle control orally twice daily. DORA-12 resulted in significant reduction in latency to persistent NREM and REM sleep, and significant increases in spindle density and SO density, without significant difference in spindle-SO coupling. While we did not observe significant differences in dream enactment measures with DORA-12 due to low sample size, all 3 mice with dream enactment displayed decreases in normalized EMG amplitude in REM and %REM with EMG bursts with DORA-12 ranging from 10 to 60%.

Conclusion: Given the importance of spindles, SO's, and their coupling on cognitive processes, these observations can motivate further evaluation of DORA's toward such cognitive processes in

neurodegenerative models as well as effect of DORA's on RBD phenotypes.
Support (If Any):

0275

EFFECT OF ACUTELY INDUCED SEVERE OSA ON AD PLASMA BIOMARKERS

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Introduction: Obstructive sleep apnea (OSA) has been associated with Alzheimer's disease (AD) progression but a causal relationship is unclear. We hypothesized that OSA can influence (AD) biomarkers including beta-amyloid (Aβ) and tau, as well as neural filament light chain (NfL).
Methods: To test this hypothesis, we examined plasma tau, NfL, Aβ42, and Aβ40 in a randomized crossover study of OSA vs. 3-night CPAP withdrawal in 30 subjects with severe OSA adherent to CPAP. We compared the overnight change in evening to morning plasma samples across the untreated night (off) versus CPAP treated night (on). Paired t-tests were used to compare measures across sleep conditions while hierarchical linear regression with difference in the overnight change of each biomarker between conditions were set as dependent variables with age and sex as covariates.
Results: Of the 30 subjects, mean age was 52 years and 27% were women. As expected, CPAP withdrawal caused sleep disruption and recurrence of underlying OSA. Sleep architecture measures including %N3 (Off: 6.1% [3.7-8.5], On: 15.1% [10.6-19.6], p<0.001), %REM (Off: 11.8% [8.8-14.7], On: 20.6% [18.3-22.9], p<0.001), and measures of breathing such as AHI4% (Off: 63/hr [54-72], On: 3/hr [2-4], p<0.001), SpO2 below 90% (Off: 20 min [14-26], On: 1 min [0-3], p<0.001), and SpO2 min (Off: 77% [74-80], On: 88% [86-90], p<0.001) were all significantly different in the untreated versus CPAP treated nights. Compared to CPAP treatment, the overnight change in NfL was increased relative to CPAP withdrawal while the overnight change in Aβ40 was decreased relative to CPAP withdrawal. No change was observed with tau or Aβ42. We found that difference in %N3 between the on- and off-CPAP conditions significantly explained an additional 15.7% of the variance beyond a base model including age and sex alone. No other difference in sleep architecture or apnea severity/hypoxemic burden metric significantly contributed to the variance in overnight change in Aβ40 between conditions, and we identified no significant predictors for variance in overnight change in NfL.
Conclusion: This study presents some of the first evidence for an effect of acute CPAP withdrawal on neurodegenerative and amyloid plasma biomarkers and implicates a role for N3 sleep in this effect.
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0276

SLEEP EEG CHANGES IN A TRANSGENIC MOUSE MODEL OF SPINOCEREBELLAR ATAXIA TYPE 3

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Introduction: Spinocerebellar ataxia type 3 (SCA3) or Machado-Joseph disease is a fatal, incurable, dominantly inherited ataxia, typically of adult-onset, and the most frequent type of SCA worldwide. SCA3 patients show progressive neuronal loss in several brain areas reflecting a broad spectrum of motor and non-motor symptoms, including ataxia, parkinsonism, and sleep disorders. In other neurodegenerative diseases, sleep disturbances alter brain homeostatic mechanisms, including DNA repair, synaptic function, and network activity, leading to deterioration of neurologic function. Sleep research has provided insights into their pathophysiology, disease prediction, and symptom management. Such studies have not been performed in SCA3. The aim of this study is to characterize sleep EEG in an SCA3 transgenic mouse model.
Methods: We used homozygous, hemizygous, and wild-type YACMJD84.2 littermate mice. To confirm the expected disease phenotype, we assessed for locomotor and exploratory activity in the morning and evening when the mice were 22 to 31 weeks old. We then implanted 6 electrodes in the frontal, parietal, and cerebellar areas. About two weeks after, we recorded their sleep activity for 15 hours (ZT0-15) per day for three consecutive days. We analyzed the data from the open-field testing and the EEG from the third day of recordings using SPSS and Matlab and a p<0.05 was considered for statistical significance.
Results: As expected, homozygous SCA3 mice showed statistically significant decreased locomotor and exploratory activities compared with wild-type littermates. In terms of sleep architecture we did not observe any significant differences between the different genotypes. Moreover, compared with wild-type, homozygous SCA3 mice displayed increased β spectral power band activity during REM. They also had decreased θ band activity, β band activity, spindle activity, and γ band acitivity during wake.
Conclusion: Our data suggest that EEG spectral power is dysregulated in homozygous SCA3 mice. Changes in β band have been observed in SCA3 patients during wake, and in patients with REM sleep behavior disorder. Therefore, future studies analyzing the sleep EEG of SCA3 patients are needed to confirm whether our findings are translatable. Further studies should also investigate the causal relationship between the observed differences in sleep and disease progression. Gaining greater insight into the role of sleep in SCA3 could provide translatable biomarkers and lead to improved assessment of the disease progression and therapeutic interventions.
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0277

DEEP LEARNING REVEALED ASSOCIATIONS BETWEEN ALTERED TEMPORAL CORRELATIONS IN MOTOR ACTIVITY AND PARKINSON'S RISK

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Introduction: Motor activity in healthy young adults displays fractal patterns with similar temporal correlations at different timescales. Altered fractal patterns were observed in patients with Parkinson's disease. This study aimed to determine whether altered fractal patterns also predict the risk of Parkinsonism.
Methods: We studied 982 participants (age: 80.12±7.27 [SD]; 750 females) from the Rush Memory and Aging Project, who had at least one actigraphy assessment, had no symptoms of Parkinsonism at actigraphy baseline, and had follow-up clinical assessments. Detrended fluctuation analysis was performed on baseline actigraphy