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Objective: Onset of Alzheimer's disease (AD) pathology is estimated to begin 20-30 years prior to clinical symptom onset. Resting state EEG may yield useful early biomarkers of pathology, but its use along the AD clinical continuum is still limited, especially in individuals who are at high risk for AD but have yet to show symptoms. EEG waveform oscillations are classified based by frequency range (alpha, beta, theta, delta). Changes within these frequency bands have been identified in individuals with AD-dementia as compared to those with MCI and normal aging. Typical changes involve increases in low frequency power bands of delta and theta and decreases in beta and alpha frequencies, particularly in more posterior brain regions. However, these methods have yet to be explored in cognitively normal individuals who are at high risk for AD, as work has shown between individuals with MCI and healthy older adults.
Participants and Methods: We compared differences in resting state EEG between older adults (age 60+) at high risk for AD (positive family history, genetic risk defined as carrying 1+ ApoE ε4 alleles) and individuals at low risk (negative family history, no ε4 allele). We collected 1) neuropsychological test performance; 2) self-report measures of subjective cognitive complaints and cognitive reserve; and 3) five minutes of eyes-open resting state EEG using 64-channel active electrodes. Clusters of three electrodes were average for regions and absolute power within 5 frequency bands was calculated. Theta/beta ratio was calculated by dividing absolute power of bands at its respective site. Correlations between absolute power for specific regions, self-report measures, and neuropsychological test scores.
Results: Analysis of 20 individuals collected to date (14 high risk, 6 low risk) found associations (p<0.05) between risk group and beta and gamma power across multiple electrode clusters, with high-risk individuals having higher power. Significant correlations were also found between calculated measures of cognitive reserve and posterior theta/beta ratio, subjective cognitive complaints and beta power, and neuropsychological test composites of learning performance with delta and executive functioning with frontal theta power.
Conclusions: This work provides preliminary evidence for differences in resting state EEG activity in those at risk for AD, prior to onset of clinical symptoms. Future work will examine patients with mild cognitive impairment as a comparison group to characterize resting state EEG across the early AD continuum.

Categories: Dementia (Alzheimer's Disease)
Keyword 1: electroencephalography
Keyword 2: cognitive functioning
Keyword 3: memory disorders
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34 Specific Agitation Behaviors in Dementia Differentially Contribute to Caregiver Burden

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Objective: Agitation is a common neuropsychiatric symptom within the dementia spectrum, experienced by 70 percent of individuals with cognitive decline. Prior literature demonstrates a strong association between care recipient agitation and burden in caregivers of individuals with dementia, as these symptoms are often difficult to manage and predict. Understanding how agitation symptoms in the person with dementia may influence caregiver burden is imperative given these strong associations; however, both agitation and burden are complex, multidimensional constructs. Agitation in dementia involves a range of behaviors including increased motor activity, emotional distress, and aggressive behaviors. Caregiver burden is also multi-faceted and often incorporates dimensions of social/relationship, emotional, and physical health strain. The current study sought to determine whether specific presentations of

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agitation differentially relate to distinct patterns of caregiver burden.
Participants and Methods: Medical record data from an outpatient memory clinic were extracted for 609 persons with dementia and their caregivers. Caregivers completed the Zarit Burden Interview (ZBI) to assess caregiver burden and the Cohen-Mansfield Agitation Inventory (CMAI) to assess care recipient agitation behaviors. At their initial outpatient appointment, care recipients were also administered a measure of global cognitive functioning (either the Montreal Cognitive Assessment or the Mini-Mental State Examination). Demographic information was extracted from medical records. Exploratory factor analysis was used to determine ZBI and CMAI factor structures. Hierarchical multiple regression analyses then examined whether factors of the CMAI differentially predicted ZBI factors, controlling for dementia severity and demographic variables.
Results: Exploratory factor analysis yielded three domains of agitation on the CMAI ("Physically Aggressive," "Physically Non-Aggressive," "Verbally Agitated") and four domains of burden on the ZBI ("Impact on Life," "Guilt/Uncertainty," "Embarrassed/Frustrated," and "Overwhelm"). Regression analyses demonstrated all domains of agitation positively predicted overall burden. Regarding specific aspects of burden, Physically Aggressive behaviors predicted only Embarrassment/Frustration (B=.41, SE=.10, β=.16, p<.001). Non-Aggressive behaviors predicted Impact on Life (B=.14, SE=.05, β=.13, p<.01) and Guilt/Uncertainty (B=.05, SE=.02, β=.10, p<.05). Verbally Agitated behaviors predicted all burden dimensions: Impact on Life (B=.35, SE=.06, β=.32, p<.001), Guilt/Uncertainty (B=.12, SE=.03, β=.22, p<.001), Embarrassment/Frustration (B=.17, SE=.02, β=.38, p<.001), and Overwhelm (B=.16, SE=.02, β=.40, p<.001).
Conclusions: Findings enhance understanding of the relationships between specific agitation symptoms and distinctive aspects of caregiver burden, suggesting that targeted interventions for aspects of caregiver burden based on agitation symptoms may be useful in alleviating burden. Interventions focused on caregivers' feelings of guilt, personal health decline, lack of time for themselves, and fear and uncertainty about the future may be effective when care recipients present with physically non-aggressive behaviors (e.g., pacing, restlessness, inappropriate dress or disrobing). When a care recipient presents with physically aggressive behaviors, helping the caregiver cope with embarrassment or anger may be of benefit. When a care recipient presents with verbally agitated behaviors, interventions targeting burden globally may be most useful. Future work should seek to replicate the current findings and explore such interventions.

Categories: Dementia (Alzheimer's Disease)
Keyword 1: caregiver burden
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35 Correlations Between Sleep and Cognitive Functioning in Healthy, Older Adults

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Objective: Alzheimer's disease (AD), a leading cause of dementia worldwide, affected an estimated 47 million people in 2015, placing a burden of over $1 trillion on health systems. Subclinical markers of AD pathology are seen many years before the clinical onset of dementia, suggesting that steps could be taken to prevent progression to disease in healthy individuals. Sleep optimizes cognition by creating a window of opportunity to consolidate memories, prune synaptic networks, and clear waste products. Studies that characterize the relationship between sleep and cognitive function prior to the onset of clinical AD could guide research into effective methods of delaying AD onset or preventing it altogether. The objective of our study is to describe how sleep quality and quantity correlate with performance on cognitive assessments within a healthy, aging population.
Participants and Methods: Seventeen participants, between 62-82 years of age enrolled in an ongoing clinical trial assessing the effects of melatonin (5mg daily) versus placebo, were included in our study. Participants were observed over a 2-month period, during which no experimental interventions were administered. At study entry, participants underwent a comprehensive neuropsychological

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