come long after initial onset. Here, we sought to use a new technology we have previously validated for research – mobile electroencephalography (mEEG) – to measure brain function to see if we could rapidly detect differences in brain activity between people with and without MCI. Methods: Participants (60: mean age 65) were recruited for a control (30) and an MCI group (30). All participants were screened for MCI using standard RBANS and the MOCA assessments. Participants completed a standard n-Back assessment of working memory while mEEG data was recorded. A key feature here is that we used mEEG technology thus application of the device and the n-Back test was completed in under 10 minutes for each participant. Results: Our key finding is that we observed increased frontal mEEG theta power (brain oscillations between 4 and 7 Hz) for MCI participants relative to controls ($p < 0.001$). Conclusions: Importantly, our work demonstrates a potential novel rapid brain-based assessment for MCI that would afford earlier detection of disease onset.

Epilepsy and eeg

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Impact of comorbid sleep disorders in patients with epilepsy on mortality risk

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Background: Pooled mortality has been observed to be almost threefold among people with epilepsy (PWE). Among PWE, epilepsy related deaths (including sudden death in epilepsy (SUDEP)), are commoner than other causes. Among these, around 16-36% are SUDEP, of which 80% events occur during sleep. SUDEP risk is most measured using the SUDEP Risk Inventory. To prevent SUDEP and reduce epilepsy related mortality, we need a better understanding, not only of the components of this screening inventory, but also additional clinical and neurophysiologic parameters that might be commoner among PWE and potentially associated with higher mortality risk. Methods: Patients diagnosed with active epilepsy over the last 3 years will form the study population, categorized into two groups: PWE with a comorbid sleep disorder, and PWE without diagnosis of a sleep disorder. Descriptive statistics will be used to report clinic and neurophysiologic characteristics of subjects enrolled. Results: We hypothesize that there is a significantly increased prevalence of sleep comorbidity among people with epilepsy compared to the general population. Poorer sleep quality could potentially have an association with higher mortality risk among epilepsy patients, Conclusions: We hope to identify and to add sleep factors such as primary sleep disorders and sleep disturbances to already established SUDEP-7 parameters.

MS/Neuroinflammatory Disease

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Personalized prediction of future lesion activity and treatment effect in multiple sclerosis from baseline MRI

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Background: Precision medicine for multiple sclerosis (MS) involves choosing a treatment that best balances efficacy and disadvantages such as side effects, cost, and inconvenience, based on an individual's unique characteristics. Machine learning can be used to model the relationship between a baseline brain MRI and future new and enlarging T2 (NE-T2) lesion count to provide personalized treatment recommendations. Methods: We present a multi-head, deep neural network for making individualized treatment decisions from baseline MRI and clinical information which (a) predicts future NE-T2 lesion counts on multiple treatments and (b) estimates the conditional average treatment effect (CATE), as defined by the predicted suppression of NE-T2 lesions, between different treatment options and placebo. We validate our model on a dataset pertaining to 1817 patients from four randomized clinical trials. Results: Our model predicts favorable outcomes (< 3 NE-T2 at follow-up) with average precision 0.780-0.994 across 5 different treatment arms. It correctly identifies subgroups with different treatment effect sizes and provides treatment recommendations that improve lesion suppression while limiting the need for high efficacy treatments. Conclusions: Our framework provides accurate predictions for future NE-T2 lesion counts and personalized treatment recommendations that improve outcomes while accounting for the disadvantages of different treatment options.

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Use of intravenous immunoglobulin for central nervous system disorders in British Columbia: consensus guidelines

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Background: Intravenous immunoglobulin (IVIG) may benefit many inflammatory central nervous system (CNS) disorders based on multiple immunomodulatory effects. IVIg is being used in inflammatory CNS conditions however robust evidence and guidelines are lacking in many disorders. Over the last 5 years,