Novel biomarkers of ALS subphenotypes using advanced imaging and spectral EEG technology

https://neurodegenerationresearch.eu/survey/novel-biomarkers-of-als-subphenotypes-using-advanced-imaging-and-spectral-eeg-technology/

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Ireland

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Novel biomarkers of ALS subphenotypes using advanced imaging and spectral EEG technology

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4

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Research Abstract

Amyotrophic Laterals Sclerosis (ALS) is a progressive neurodegenerative disease of unknown origin. There is a well-established link between ALS and frontotemporal executive dysfunction (FTD). There is a recognized need to develop reliable biomarkers that both reflect disease categories, and that are informative for disease onset progression and survival. Our previously published large longitudinal population based cohort study has shown that ALS can be categorized into subgroups based on cognitive status and that these subgroups have different

disease trajectories. The main hypothesis of this proposal is that a combination of high resolution structural and dynamic imaging of the brain at 3 Tesla, coupled with spectral EEG analysis and detailed neuropsychological assessment can be utilized to subphenotype ALS into different cohorts; and that the imaging and neurophysiologic correlates may also be suitable for development as early biomarkers of progressive cognitive decline in ALS. Spectral EEG is a promising technology in neurodegeneration, and a useful biomarker of progressive alterations in functional connectivity in Alzheimer's Disease and FTD . An argument for the development of EEG based approaches in ALS is the recognition of extensive and progressive break-down in intrahemispheric connectivity as evidenced by resting state fMRI studies and consistent corpus callosum involvement in ALS regardless of genotypes. Assessing network integrity of the same patient cohort with both MRI and EEG serves as a powerful validation tool. This methodology will also be developed for individual level evaluation, and to quantify the risk for developing the disease in at risk groups. This will be of utility in future studies of asymptomatic family members particularly with the advent of effective disease modifying therapies.

Further information available at:

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