Early detection of frontotemporal dementia (EDoF): A digital biomarker study

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Background: With the commencement of clinical trials in frontotemporal dementia (FTD), robust biomarkers that can detect the earliest signs of the disease and also measure treatment effect, are essential. Pen and paper assessments are laborious, administered infrequently, and can rely on subjective reporting. Using digital devices allows for more frequent, often continuous, assessment from home, whilst producing a wealth of objective data. The Early Detection of Frontotemporal dementia (EDoF) study aims to develop a series of digital measures that may be useful for the diagnosis of FTD and for outcome measures in trials.

Method: The EDoF study includes: a computerised cognitive battery, a mobile eye tracking device, a novel app that passively measures cognitive function by monitoring smartphone metadata, speech and language analysis using machine learning algorithms, actigraphy, and gait analysis. These measures are being validated in a large control population before being tested in symptomatic and presymptomatic genetic FTD within the Genetic FTD Initiative (GENFI) study.

Result: We are currently recruiting participants to the initial arms of the study, with over 1,300 healthy controls having already completed the computerized cognitive battery. The mobile eye tracking device measures eye movement abnormalities but also uses instructionless eye movement tasks to measure executive function and social cognition. Pilot eye tracking data shows abnormalities of these tasks in symptomatic FTD, and also for antisaccadic eye movements in presymptomatic FTD. Normative data for all of the measures will be generated helping to assess construct validity and retest reliability.

Conclusion: EDoF is the first study aiming to use a comprehensive set of digital measures to detect early FTD. It may also prove useful for home monitoring within future therapeutic trials of FTD.