QEEG CAN DISTINGUISH PATIENTS WITH AD AND VOLUNTEERS

Introduction
Quantitative Electroencephalography (qEEG) has been shown to distinguish AD patients from healthy controls (HC) at a group but not at an individual level. A novel qEEG data analysis method created at the University of Sheffield can measure linear and non-linear levels of brain synchronisation in the time domain.

Methods
Patients with AD and HV had resting state EEGs. The standard 10–20 international system of EEG electrode placement was used. All patients had MRI and detailed neuropsychology as part of the European VPH-DARE@IT project. Custom made software (Error Reduction Ratio-causality (ERR-causality) analysed average strength of linear and non-linear synchronisation in bicentroparietal region.

Results
10 HC and 10 AD EEGs were included. Mean ages were 58.1 (AD) versus 62.2 y (HV). Mean mini-mental state examinations were 17.5 (AD) and 28.50 (HV). The ratio of bi-centroparietal synchronisation between eyes open & eyes close (EO/EC) showed a striking difference between the two groups (AD ratio 0.814 versus HC ratio 0.282, p=0.0006).

Conclusions
These results suggest that patients with AD have higher levels of EO bi-centroparietal synchronisation & in particular the ratio between EO/EC synchronisation has potential to be used as a non-invasive and inexpensive biomarker or diagnostic tool for AD.
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