CHANGE IN PASAT PERFORMANCE CORRELATES WITH CHANGE IN P3 ERP AMPLITUDE OVER A 12-MONTH PERIOD IN MULTIPLE SCLEROSIS PATIENTS

H. Kiiski¹, R.B. Reilly¹, R. Lonergan², S. Kelly², M.C. O’Brien³, K. Kinsella², J. Bramham³, E.T. Burke³, S. O’Donnchadha³, H. Nolan¹, M. Hutchinson², N. Tubridy², R. Whelan¹

¹Trinity Centre for Bioengineering, Trinity College Dublin, ²Department of Neurology, St. Vincent’s University Hospital, ³School of Psychology, University College Dublin, Dublin, Ireland

Introduction: Cognitive impairment affects ~65% of multiple sclerosis (MS) patients. Cognitive electrophysiological measures have advantage over neuropsychological measures (such as PASAT) as they are not influenced by practice effects, education, anxiety or physical ability.

Aims: To examine the correlation between the change in PASAT and the change in P3 event-related potentials (ERPs) over a 12-month period in MS patients, and to compare the 12-month change in the P3 ERP between MS patients and controls.

Methods: Forty-four subjects (27 MS, 17 controls) completed visual and auditory two-stimulus and three-stimulus oddball tasks at Month 0 and Month 12. Data were recorded from a 128-scalp channel electroencephalography array. Data from scalp channels were converted into continuous interpolated images (incorporating entire scalp and time). Amplitude, topographical differences and correlations were then tested using statistical parametric mapping.

Results: The change in visual and auditory P3a correlated significantly with the change in PASAT score (r=0.54, p=0.001 and r=0.49, p=0.002, respectively) (Figure1). Visual P3 ERP amplitudes showed greater decrease in 12 months in MS patients relative to controls.

Conclusions: Change in both P3a ERP amplitudes correlate with change in PASAT in MS patients. P3 ERPs may have utility in monitoring change in cognitive functioning in MS.
[Figure 1]