

Oral presentation

Predicting cognitive decline in Mild Cognitive Impairment

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Recent studies described several changes of endogenous event related potentials (ERP) and brain rhythm synchronization during memory activation in patients with Alzheimer's disease (AD). To examine whether memory-related EEG parameters may predict cognitive decline in mild cognitive impairment (MCI), we assessed P200 and N200 latencies as well as beta event-related synchronization (ERS) in 16 elderly controls (EC), 29 MCI cases and 10 patients with AD during the successful performance of a pure attentional detection task as compared to a highly working memory demanding 2-back task. At one year follow-up, sixteen MCI patients showed progressive cognitive decline (PMCI) and thirteen remained stable (SMCI). Both P200 and N200 latencies in the 2-back task were longer in PMCI and AD cases compared to EC and SMCI cases. During the interval 1000 ms to 1700 ms after stimulus, beta ERS at parietal electrodes was of lower amplitude in PMCI and AD compared to EC and SMCI cases. Univariate models showed that P200, N200 and log% beta values were significantly related to the SMCI/PMCI distinction with areas under the receiver operating characteristic curve of 0.93, 0.78 and 0.72, respectively. The combination of all three EEG hallmarks was the stronger predictor of MCI deterioration with 90% of correctly classified MCI cases. Our data reveal that PMCI and clinically overt AD share the same pattern of working memory-related EEG activation characterized by increased P200-N200 latencies and decreased beta ERS. They also show that P200 latency during the 2-back task may be a simple and promising EEG marker of rapid cognitive decline in MCI.