Event Related Potentials (ERPs) during Stroop task: comparison between normal aging and Mild Cognitive Impairment – MCI.


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Objective The aim of our study was to assess if Event-Related Potentials (ERPs) in subjects with Mild Cognitive Impairment (MCI) are able to reveal a neurophysiological index of alteration in executive functions, that are commonly preserved at the neuropsychological examination.

Materials and methods: a modified Stroop task was administered to a group of 9 MCI (4 males and 5 females: age 70±7; education 11±4) – diagnosed according with Peterson’s criteria – and to a group of 6 health control (2 males and 4 females: age 73±6, education 11±3), while electroencephalographic activity was recorded.

Results We found a difference between two groups only in the electrophysiological response, but not in the behavioural parameters (accuracy – control 0.77±0.16 vs. MCI 0.79±0.17 – and reaction times-RT – 769±67 vs. 759±125). In particular the analysis of ERPs comprised within a 200-350 ms temporal window, show a difference in the processing of congruent and incongruent stimuli in the control subjects in the frontal and central scalp regions, while in MCI there are no modulation in the electrophysiological elaboration of the two different stimuli. Furthermore we found a general, stimuli-independent, reduction of the amplitude of ERPs in this time interval in MCI patients compared to controls for both congruent and incongruent stimuli \[ F(1,10) 8.8, \text{p}=0.1 \].

Conclusions These results suggest a sub-clinical deficit in the processing of conflicting stimuli in MCI, no evident in the behavioural performance at Stroop task. Probably, in the early phase, the MCI patients can use a compensatory strategies to execute a cognitive task, so the difference with the normal aging appear only in a neurophysiological pattern alteration. Our data suggest that ERPs could play a role in the diagnosis of MCI, in addition to the classical clinical assessment.

References


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