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Clinical correlates of executive dysfunctions in mild cognitive impairment

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Objective: Cross-sectional studies have so far suggested a gradual decline across the adult life span of executive functions, although it is unclear whether these effects are due to age-associated response slowing or to a genuine impairment. Whether preservation of executive function relates to factors such as level of education, vascular risk factors or emotional status needs to be clarified. Purpose of the present study was to investigate these issues in a population of elderly subjects affected by Mild Cognitive Impairment (MCI).

Methods: One hundred-sixty-eight MCI outpatients were investigated. The main end point was the analysis of the socio-demographic, clinical and neuropsychiatric characteristics of two groups of MCI classified on the basis of their performance on two cognitive test: Trail Making Test (TMT) A and TMT B. Subjects with a poor score (≥ 1.5 SD below age and education adjusted norms on standard neuropsychological tests) in one or both tests were ordered as Executive Functions impaired (EF impaired).

Results: Eighty subjects (47,6%) resulted EF impaired. The main significant (T-test, $p \leq .05$) features that differed EF impaired from EF not impaired MCI subjects were: older age, lower education, a greater number of somatic diseases and of chronically drugs intake, greater functional (IADL functions lost) and motor disabilities (Tinetti scale), recurrent presence of more than one vascular risk factors, poorer global cognitive performance measures (MMSE, ADAS-Cog and CDR sum of boxes) and more severe anxiety symptoms at the Neuropsychiatry Inventory. The two groups were comparable as regards measures of memory retrieval. A logistic regression model revealed that among these socio-demographic and clinical features, old age (≥ 80 years; OR=4.42; $p=.02$) and low education (≤ 5 years; OR=3.01; $p=.003$) were the only two variables independently correlate with the presence of impaired executive functions among MCI subjects.

Conclusions: We observed a strong association between poor performance on TMT and low educational level, suggesting that preservation of executive function correlates strictly to level of education and to age rather than to other clinical or socio-demographic features. In light of the present data the "cognitive reserve" theory, proposing that people with higher education show clinical symptoms of dementia later than those with less education, should be revised and restricted to executive functions.