

Quantitative EEG markers in mild cognitive impairment: Degenerative versus vascular brain impairment

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We evaluated the relationship between brain rhythmicity and both the cerebrovascular damage (CVD) and amygdalo-hippocampal complex (AHC) atrophy, as revealed by scalp electroencephalography (EEG) in a cohort of subjects with mild cognitive impairment (MCI). The CVD group, with 99 subjects, and the AHC atrophy group with 79 subjects.

All MCI subjects (Mini-Mental State Examination [MMSE] mean score 26.6) underwent EEG recording and magnetic resonance imaging (MRI). EEGs were recorded at rest. Relative power was separately computed for delta, theta, alpha1, alpha2, and alpha3 frequency bands.

In the spectral band power the severity of CVD was associated with increased delta power and decreased alpha2 power. No association of vascular damage was observed with alpha3 power. Moreover, the theta/alpha 1 ratio could be a reliable index for the estimation of the individual extent of CV damage. On the other side, the group with moderate hippocampal atrophy showed the highest increase of alpha2 and alpha3 power. Moreover, when the amygdalar and hippocampal volume are separately considered, within amygdalo-hippocampal complex (AHC), the increase of theta/gamma ratio is best associated with amygdalar atrophy whereas alpha3/alpha2 ratio is best associated with hippocampal atrophy.

CVD and AHC damage are associated with specific EEG markers. So far, these EEG markers could have a prospective value in differential diagnosis between vascular and degenerative MCI. Moreover, EEG markers could be expression of different global network pathological changes, better explaining MCI state.

Biography

Moretti Davide Vito is consultant neurologist, chief of the clinical neurophysiology service and researcher at the National Institute of Research and Cure for Mental disorders and Dementia S John of God, Brescia, Italy. He received his medical degree from Catholic University in Rome and completed his residency in neurology and fellowship in movement disorders at University of Trieste, Italy. Moreover, he received the Ph.D. in neurophysiology at La Sapienza University (thesis title "Quantitative EEG in Alzheimer's disease"). He is currently involved in research and care of subjects with Alzheimer's disease and dementia in the Memory Clinic/Alzheimer Operative Unit of the S. John of God Institute. Moreover, he is the chief of the clinical neurophysiology unit. His research is primary concerned about quantitative EEG evaluation of Alzheimer's patients both in prodromic and clinically evident phase of the disease.

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