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Quantitative EEG in Alzheimer's disease, Parkinson's disease and MCI patients before and after standardized tests on fatigue

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Objectives: Alzheimer's disease (AD) is characterized by changes in spectral power and EEG-coherence, which become stronger with the progression of dementia (T Dieks 2000, D Mantini 2007, L Prichep 2004). In Parkinson's disease there is increase of slow wave activity, these changes appeared in preclinical –mild cognitive impairment patients (MCI) and early stage of AD. They could be visualized more with the specific cognitive tasks, especially, tests on fatigue, which were performed by many authors (B Saletu 2002). The aim was to evaluate spectral power and EEG-coherence in AD, PD and MCI groups and healthy elderly controls, to find their reactivity before and after standardized tests on fatigue before and after 3, 6, 9, 12, 15 months and after 4.5 years of treatment with galantamine, memantine and their combination. The tests on fatigue were performed in order to evaluate cognitive reserve, dynamic and efficacy of treatment. The probe on fatigue included two tests on attention-10 minutes per each test. The degree of fatigue was evaluated by increasing the mistakes from first to last minute of both tests.

Materials & Methods: 40 MCI amnesic type patients, 46 patients with mild and moderate AD (DSM-4 criteria) on 3, 6, 9, 12 and 15 months treatment, 42 patients on long term treatment, 40 patients with PD and 45 age-matched controls were examined using EEG-recordings, neuropsychological investigations and neuropsychiatric inventory (NPI).

Results: We have found significant increase of slow-wave activity and decreased alpha rhythm and coherence in central, frontal and temporal regions in both hemispheres in AD group vs. MCI, AD vs. controls, MCI vs. controls ($p<0,05$), which become significantly stronger after tests on fatigue. In PD vs. controls there was increase of slow-wave activity and decreased alpha rhythm and coherence in central and temporal regions in both hemispheres. We found significant positive dynamic in EEG changes on short and long term treatment after tests on fatigue.

Conclusion: EEG changes before and after tests on fatigue, cognitive and neuropsychiatric impairments have positive dynamic on short and long term treatment. The significant positive dynamic in EEG was visualized especially after standardizes tests on fatigue, which could be specific indicator of the dynamic and efficacy of the treatment.

Biography

Anastasia Medvedeva is doing her PhD in the Department of Neurology at First Moscow Medical University, Moscow, Russia. She is a Neurologist at the European Medical Center, Russia.

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