EPV0625

EEG dynamics during long-term treatment of depression in young female patients

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Introduction: The need to study and clarify the neurobiological basis of depression is due to the widespread prevalence and heavy socioeconomic burden of this disease. In order to prevent relapses, it is recommended to continue treatment for depression for a long time after the relief of the main depressive symptoms. However, delayed EEG changes have been almost completely unstudied.
Objectives: The aim of the study was to analyze the dynamics of spectral-coherent EEG parameters during long-term treatment for endogenous depression in young female patients.
Methods: The study included 20 female patients aged 16-25 years who underwent quantitative clinical (using the HDRS-17 and GAF scales) and neurophysiological (multichannel resting EEG recordings with subsequent analysis of absolute spectral power and EEG coherence) examination three times: upon admission to hospital before the start of the course of treatment (at visit 1), upon discharge from the hospital at the stage of remission establishing (at visit 2) and one year after discharge from the hospital on maintenance therapy (at visit 3). The clinical and EEG changes were statistically assessed using the Wilcoxon test.
Results: After the course of stopping treatment (at visit 2), there was a significant ($p<0.01$) reduction in depressive symptoms. This was associated with an EEG slowdown in the form of a generalized increase in the spectral power of theta-delta activity (2-4 Hz and 4-8 Hz), which was significant ($p<0.05$) in the frontal-central leads, and a significant ($p<0.05$) decrease in the alpha2 (9-11 Hz) and alpha3 (11-13 Hz) components of the alpha rhythm in the occipital zones. Further improvement in the clinical condition (according to the HDRS-17 scale) and social functioning (according to the GAF scale) was noted a year later (at visit 3), and was associated with the same EEG pattern, including a significant ($p<0.05$) increase of theta2 subband (6-8 Hz) spectral power in the central-parietal-occipital leads.
Conclusions: The observed EEG slowdown is considered to be a reflection of a complex restructuring of brain activity into a mode more adequate for these patients, ensuring the suppression of depressive symptoms and restoration of the social functioning of patients, rather than traditionally considered general decrease of the brain functional state.

Disclosure of Interest: None Declared

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Neurophysiological correlates of decision-making efficiency in depressive disorders

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Introduction: Reduced ability to make adequate decisions significantly affects the daily functioning and social adaptation in depressive patients. Neurophysiological bases of reduced efficiency of decision-making based on both logical reasoning and emotional processes are not sufficiently studied.
Objectives: The aim of the study was to search for possible links between signs of decision-making efficiency and EEG parameters in depressive patients.
Methods: The study involved 48 depressive female in-patients (F31.3-4, F34.0, by ICD-10), aged 16-25 years (mean age 18.4 ± 2.6). To assess the decision-making process, computer versions of the Wisconsin Card Sorting Test (WCST) and the Iowa Game Task (IGT) were used. Multichannel resting EEG recordings with spectral power analysis were performed at the same visit before the start of treatment. The rank correlation analysis (Spearman) was used for statistical data processing.
Results: In WCST test, negative correlations ($p<0.05$) were found between the "percentage of conceptual level responses", and the spectral power values of beta1 (13-20 Hz), beta2 (20-30 Hz) in the central and posterior areas, and theta1 (4-6 Hz) in anterior areas of the cerebral cortex. Delta (2-4 Hz) activity values in the left frontal areas positively correlated with the WCST parameters "number of moves spent on completing the first category", "number of perseverations on the previous move", "number of moves" and "test completion time". Thus, patients complete the task longer and less effectively with frontal hypoactivity and increased activation of the posterior areas of the cortex that reflects a violation of the brain's inhibitory mechanisms. In the IGT test, positive correlations ($p<0.01$) were revealed between the number of choices of the "bad" deck (A) and both "bad" decks (A and B), as well as negative correlations between the preference for "good" (C and D) over "bad" (A and B) decks in the second half of testing and the values of the alpha2 (9-11 Hz) spectral power in the anterior areas of the left hemisphere. The preference for "good" over "bad" decks on moves 40–60 negatively correlated with the values of alpha3 (11-13 Hz) and beta2 (20-30 Hz) in the right frontal and central areas. Thus, decision-making deficit in the IGT was associated with a relative decrease in the activation of the anterior regions of the left hemisphere and hyperactivation of the right hemisphere.
Conclusions: In depressive patients, impairments in the logical reasoning task (WCST) are associated with hypofrontality while impairments in the emotional learning task (IGT) – with disbalance of hemispheric activation, namely with hypoactivation of the frontal regions of the left hemisphere and increased activation of the right hemisphere.

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EEG features in young female depressive patients with ultra-high risk of psychosis

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Introduction: One of the directions of scientific research in modern psychiatry is the search for predictors of the developing of a manifest psychotic attack in patients with non-psychotic disorders,