Introduction: Use of combined antidepressive treatment included high-frequency rhythmic transcranial magnetic stimulation (rTMS) of the left dorsolateral prefrontal cortex (DLPFC) is one of the ways for overcoming of pharmaco-resistance in depressive patients.
Objectives: The aim of the study was the search for possible EEG predictors of antidepressive effects of rTMS of the left DLPFC in combined treatment of depression.
Methods: 30 female in-patients (F31.3, F33.0, F33.1, by ICD-10; 20-50 years, mean age 36.9±10.3) with pharmaco-resistant depression were enrolled in the study. Treatment included antidepressants (mainly SSRI) and a 3-week course of rTMS (20 Hz) of the left DLPFC. Correlations between pre-treatment EEG spectral power values, and post-treatment quantitative clinical assessments of patients were analyzed. Responders/non-responders were determined by standard criteria of 50% decrease in HDRS-17 scale total scores after treatment course.
Results: Responders (23 out of 30) revealed significant ($p<0.05$) negative correlations between post-treatment HDRS-17 scores and pre-treatment EEG spectral power in theta-2 (6-8 Hz) and alpha-1 (8-9 Hz) frequency sub-bands in the parietal-occipital-posterior temporal leads. Non-responders (7 out of 30) showed negative correlations between the post-treatment HDRS-17 scores and pre-treatment theta-2 EEG spectral power in the frontal-central-temporal regions of the right hemisphere.
Conclusions: Even brief course of rTMS of the left DLPFC enhances the action of antidepressants, and allows overcoming partially the pharmaco-resistance in depressive patients. Baseline values of theta-2 and alpha-1 EEG spectral power may serve as possible predictors of the effects of combined antidepressive therapy including rTMS. The study supported by RBRF grant No.18-01-00029a.

Disclosure: No significant relationships.
Keywords: transcranial magnetic stimulation; baseline EEG; prediction of treatment effects; pharmaco-resistant depression

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Individual dynamics of daily life functioning of reward system can predict future level of depressive symptoms

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Introduction: The reward system regulates the processes that motivate people to pursue evolutionary beneficial stimuli. Effective functioning of the reward system can protect against the development of anhedonia. In the daily life, the reward system can be expressed as the dynamic interplay of positive affect (liking), reward anticipation (wanting), and active behavior (engaging). Applying network analysis to daily life experience data allows us to identify such reward dynamics and use them to predict future depressive symptoms.
Objectives: We investigated whether at baseline (i) higher network positive affect in-strength, reflecting how strongly positive affect is influenced by other components and hence the level of anhedonia, and (ii) higher network connectivity, reflecting overall functioning of the reward system, are associated with fewer depressive symptoms on follow-up.
Methods: We used data from 43 participants with mild depressive symptoms from the SMARTSCAN study. The dynamic interplay between momentary positive affect, reward anticipation, and active behavior was assessed with individual vector-autoregressive models and the network analysis. Network positive affect in-strength and connectivity indices were used to predict a six-month depressive symptoms trajectory.
Results: Reward systems networks vary greatly between individuals. On the group level, higher positive affect in-strength (Beta=-3.66, p=0.05) and network connectivity (Beta=-4.06, p=0.03) at baseline were associated with fewer symptoms at follow-up.
Conclusions: Higher influences of reward anticipation and active behavior on positive affect and stronger connections between reward cycle components are associated with fewer future symptoms, suggesting the importance of daily life reward cycle dynamics in depression.

Disclosure: No significant relationships.
Keywords: reward system; reward dynamics; Depression; Network analysis

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Potential of antithrombin III as a biomarker of antidepressive effect in major depressive disorder

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Introduction: Previous study has identified increased antithrombin III (ATIII) in patients with major depressive disorder (MDD), supporting ATIII as a potential biomarker for depression diagnosis.
Objectives: This study aimed to reveal the alteration of ATIII after occipital repetitive transcranial magnetic stimulation (rTMS), and illuminate its power to evaluate and predict the curative effects in MDD treatment.
Methods: A total of 90 MDD patients were recruited and further intervened with rTMS in occipital for individualized, standard or sham treatment for five days. Those of 74 patients underwent entire detection, including clinical assessments, blood collection and protein measurement.
Results: After treatment, decreased ATIII were detected in both the individualized and the standard group (p=0.000 and 0.001, respectively) instead of the sham one. Especially, the reduction in ATIII in the individualized group was associated with improvements in several neuropsychological assessments. Besides, ATIII at baseline in the standard group and after the individualized rTMS showed high performance to evaluate or predict the response to the 5-day treatment (AUC=0.771, 95%CI, 0.571-0.971; AUC=0.875, 95%CI, 0.714-1.000, respectively) and the remission in follow-up (AUC=0.736, 95%CI, 0.529-0.943; AUC=0.828, 95%CI, 0.656-1.000, respectively). Furthermore, both baseline ATIII and change