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THE POTENTIAL OF BLOOD DERIVED INFLAMMATORY BIOMARKERS IN PREDICTING THE THERAPY SUCCESS OF RTMS FOR TREATMENT RESISTANT DEPRESSION PATIENTS

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Background: The resistance of depression to pharmaceutical treatment is a significant challenge in psychiatry. In such cases, additional therapies like brain stimulation methods, such as repetitive transcranial magnetic stimulation (rTMS), are employed. However, the effectiveness of these treatments varies due to limited understanding of treatment-resistant depression (TRD) physiology and rTMS mechanisms. Failing to identify drug-resistant patients early and adjust treatments accordingly leads to wasted time and resources in hospitals. Addressing this issue necessitates deeper insights into the biological mechanisms causing treatment resistance and the establishment of observable biomarker dynamics correlating with clinical improvement when the right therapy is chosen.
Aims & Objectives: Given the increasing data linking TRD to chronic inflammatory processes, this study focused on measuring various inflammation-related blood-derived biomarkers. The aim was to assess their potential for diagnosing TRD and evaluating rTMS treatment effectiveness in drug treatment- resistant depression. Valid biomarker panels could enhance TRD diagnostic accuracy, offer credible rTMS treatment prognosis, aid in individualizing treatment strategies, and reduce hospitalization duration.
Method: The study took place at Republican Vilnius Psychiatric Hospital, involving 19 TRD patients undergoing rTMS and 11 depressed patients, responding to medication, as a comparison group. Therapeutic efficacy was evaluated using MADRS, HAM-D-17, GAD-7, and PHQ-9 tests. Inflammatory markers, neurotrophins, and associated miRNAs were measured in patients' blood serum before and during treatment. A control group of 18 healthy individuals provided baseline data.
Results: Our study revealed significantly higher levels of pro-inflammatory interleukins-6 and -8 in TRD patients compared to drug responders, correlating with more severe symptoms before treatment. TRD patients exhibited higher blood serum concentrations of pro-inflammatory interleukin-18 and lower levels of anti-neuroinflammatory miR-146a-5p, both before and during treatment, compared to healthy controls. Notably, miR-16-5p, miR-93-5p, and especially miR-146a-5p expression correlated with clinical changes following rTMS.
Discussion & Conclusion: The findings confirm that TRD patients have a heightened inflammatory status. Furthermore, anti-neuroinflammatory miR-146a-5p demonstrated significant potential for predicting rTMS treatment success. These results underscore the importance of understanding inflammation- related mechanisms in TRD and emphasize the promising role of miR-146a-5p as a predictive biomarker in rTMS treatment outcomes.

References

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